

For Reference

NOT TO BE TAKEN FROM THIS ROOM

Ex LIBRIS
UNIVERSITATIS
ALBERTAE NSIS



For Reference

NOT TO BE TAKEN FROM THIS ROOM



Digitized by the Internet Archive
in 2020 with funding from
University of Alberta Libraries

<https://archive.org/details/Gilbert1968>

THE UNIVERSITY OF ALBERTA

A STUDY OF TEACHER UTILIZATION OF TIME IN A CONVENTIONAL
SCHOOL AND IN A TEAM TEACHING SCHOOL

by



LARRY L. GILBERT

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE
OF MASTER OF EDUCATION

DEPARTMENT OF EDUCATIONAL ADMINISTRATION

EDMONTON, ALBERTA

SEPTEMBER, 1968

THESIS
1968 (F)
79

ii

UNIVERSITY OF ALBERTA
FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "A Study of Teacher Utilization of Time in a Conventional School and in a Team Teaching School" submitted by Larry L. Gilbert in partial fulfillment of the requirements for the degree of Master of Education.

ABSTRACT

The main purposes of this study which investigated teacher distribution of time during the school day were: (1) to determine whether there are differences in time utilization between teachers classified by personal characteristics; (2) to determine whether there are differences in time utilization between teachers classified by professional characteristics; (3) to determine whether there are differences in time utilization between teachers classified by the type of school (conventional or team teaching); and (4) to determine whether there are differences in time distribution on various categories of activity between various parts of the day.

The data for the criterion variable were obtained by observing nine teachers in a conventional school and six in a team-teaching school for a period of three weeks during the spring term, 1968. The activities performed by the teachers throughout the school day were classified into eighteen predetermined categories of activities. The data for the predictor variables (age, sex, marital status, field or specialization, years of university education, years of teaching experience, type of school) were obtained from responses to a brief questionnaire which was completed by each teacher. The data for the predictor variable time unit of the day were grouped according to an arbitrary division

of the school day.

Chi square tests indicated that teachers when classified by any one of the predictor variables differed significantly at the .001 level of significance on the distribution of time over all the activities.

A Mann-Whitney U or a Kruskal-Wallis test was used to determine whether teachers differed significantly (at the .05 level of significance) in the utilization of time on individual activities. Teachers classified by age differed in activities 1 (Conducting routine), 2 (Control), and 3 (Presenting information). Teachers classified by sex differed in activity 10 (Clerical writing). There were no significant differences in any individual activity when teachers were classified by each of the following variables: marital status, field of specialization, and years of university education. Teachers classified by years of teaching experience differed in activity 9 (Creative writing). Teachers classified by type of school differed in activities 1 (Conducting routine), 6 (Observing), 7 (Interacting with adults), 14 (Transition--teacher), and 18 (Unable to observe). Teachers classified by time unit or the day differed in activities 1 (Conducting routine), 4 (Instructional supervision), 7 (Interacting with adults), 15 (Travel), 16 (Personal), and 17 (No interpretable activity).

ACKNOWLEDGMENTS

The writer wishes to express his thanks for the abundant and helpful assistance offered by Dr. E.W. Ratsoy, the supervisor of this study. Thanks are also extended to Dr. D.A. MacKay for his helpful and challenging criticism, and to Dr. P.A. Lane.

The writer wishes to express his appreciation to the principals and staff members who made this study possible.

A special thanks is given for the time, effort, and advice offered by Mr. Murray Ellison, a fellow graduate student.

Finally, the writer wishes to thank the Canadian people and the University of Alberta for providing the opportunity to do Graduate Studies and the financial assistance to continue them.

TABLE OF CONTENTS

CHAPTER	PAGE
I. INTRODUCTION	1
The Problem	2
Statement of the Problem	2
Sub-Problems	2
Definition of Terms	3
Importance of the Study	5
Assumptions	7
Limitations	8
Delimitations	9
Organization of the Thesis	9
References for Chapter I	11
II. RELATED LITERATURE AND HYPOTHESES	12
Time Utilization in Conventional Schools	12
Personal and Professional Characteristics and Time Utilization	18
Time Utilization in Team Teaching Schools	20
Hypotheses	23
Summary	25
References for Chapter II	28
III. INSTRUMENTATION, METHODOLOGY, AND TREATMENT OF DATA	30
Instrumentation	30
Methodology	33

CHAPTER	PAGE
III.	
Training Period	33
Collection of Data	35
Treatment of Data	40
Coding and Punching	40
Descriptive Analysis of Activity Data	40
Procedure Used in Testing the Hypotheses	41
Summary	48
References for Chapter III	51
IV.	
DESCRIPTION OF SAMPLES	52
Personal Characteristics of Teachers	52
Age	52
Sex	54
Marital Status	54
Professional Characteristics of Teachers	54
Field of Specialization	57
Years of Education	57
Years of Teaching Experience	57
Description of the Two Schools	60
Location	60
Size and Age	60
Layout	62
Principals	63
Departmentalization	64
Time Periods of the School Day	64
Summary	66

CHAPTER

PAGE

V. STATISTICAL ANALYSIS OF DATA AND RESULTS	68
A Comparison of Teacher Activities When Teachers are Classified by Age, Sex, and Marital Status	69
Hypothesis 1.1: Age	70
Results	70
Discussion	72
Conclusion	74
Hypothesis 1.2: Sex	74
Results	75
Discussion	75
Conclusions	78
Hypothesis 1.3: Marital Status	78
Results	78
Discussion	78
Conclusions	81
A Comparison of Teacher Activities When Teachers are Classified by Field of Specialization, Years of Education, and Years of Teaching Experience	81
Hypothesis 2.1: Field of Specialization	82
Results	82
Discussion	84
Conclusions	84
Hypothesis 2.2: Years of Education	84
Results	86
Discussion	86
Conclusions	89

CHAPTER	PAGE
V.	
Hypothesis 2.3: Years of Experience	89
Results	89
Discussion	89
Conclusions	92
A Comparison of Teacher Activities When Teachers are Classified by Conventional School and Team Teaching School	92
Hypothesis 3: Type of School	93
Results	93
Discussion	93
Conclusions	99
A Comparison of Teacher Activity Scores When Scores are Classified by the Time Unit of the Day	99
Hypothesis 4: Time Unit	100
Results	100
Discussion	100
A Comparison of Teacher Activity Scores to Determine the Association Between Variables and the Percentage of Time Spent on Activities	105
Results and Discussion	106
Conclusion	113
Summary	113
References for Chapter V	116
VI. SUMMARY, CONCLUSIONS, AND IMPLICATIONS	117
Summary	117
The Problem	117
Hypotheses	117

	x
CHAPTER	PAGE
VI. . Instrumentation and Methodology	118
Sample	119
Results	119
Conclusions and Implications	123
Conclusions	123
Implications	124
BIBLIOGRAPHY	126
APPENDIX A	129
APPENDIX B	133

LIST OF TABLES

TABLE	PAGE
I. Calculation of Reliability Coefficient Using Per Cent	36
II. Calculation of Reliability Coefficient Using Per Cent	39
III. Activity Scores (Percent) on Eighteen Activities When Teachers are Classified by School and by Total Sample	42
IV. Activity Scores (Percent) in Each Activity When Teachers are Classified by Age, Sex, and Marital Status	43
V. Activity Scores (Percent) in Each Activity When Teachers are Classified by Field of Specialization, Years of Education, and Years of Teaching Experience	44
VI. Activity Scores (Frequency) in Each Activity When Scores are Classified by the Time Unit of the Day	45
VII. Distribution of Teachers by Age	53
VIII. Distribution of Teachers by Sex	55
IX. Distribution of Teachers by Marital Status	56
X. Distribution of Teachers by Field of Specialization	58
XI. Distribution of Teachers by Years of Education	59
XII. Distribution of Teachers by Years of Teaching Experience	60
XIII. Chi Square Test of the Difference Between Distribution of Activity Scores When Teachers are Classified by Age (Years)	71
XIV. Kruskal-Wallis Analysis of Variance Tests of Differences Between Activity Scores When Teachers are Classified by Age	73

TABLE

PAGE

XV.	Chi Square Test of the Difference Between Distributions of Activity Scores When Teachers are Classified by Sex	76
XVI.	Mann-Whitney U Test of Differences Between Activity Scores When Teachers are Classified by Sex	77
XVII.	Chi Square Test of the Difference Between Distributions of Activity Scores When Teachers are Classified by Marital Status	79
XVIII.	Mann-Whitney U Test of Differences Between Activity Scores When Teachers are Classified by Marital Status	80
XIX.	Chi Square Test of the Difference Between Distributions of Activity Scores When Teachers are Classified by Field of Specialization	83
XX.	Kruskal-Wallis Analysis of Variance Test of Differences Between Activity Scores When Teachers are Classified by Field of Specialization	85
XXI.	Chi Square Test of the Difference Between Distributions of Activity Scores When Teachers are Classified by Years of Education	87
XXII.	Kruskal-Wallis Analysis of Variance Test of Differences Between Activity Scores When Teachers are Classified by Years of University Education	88
XXIII.	Chi Square Test of the Difference Between Distributions of Activity Scores When Teachers are Classified by Years of Teaching Experience	90
XXIV.	Kruskal-Wallis Analysis of Variance Test of Difference Between Activity Scores When Teachers are Classified by Years of Teaching Experience	91
XXV.	Chi Square Test of the Difference Between Distributions of Activity Scores When Teachers are Classified by Type of School	94

TABLE

PAGE

XXVI.	Mann-Whitney U Test of Difference Between Activity Scores When Teachers are Classified by Type of School	95
XXVII.	Chi Square Test of the Difference Between Distributions of Activity Scores When Scores are Classified by Time Unit of the Day	101
XXVIII.	Kruskal-Wallis Analysis of Variance Test of Differences Between Scores When Scores are Classified by Time Unit of the Day	102
XXIX.	Tests of Differences Between Distributions of Scores and Between Scores in Individual Activities	107
XXX.	Contingency Table of Activity Scores in Activity 1 Classified by Type of School and Age	108
XXXI.	Contingency Table of Activity Scores in Activity 1 Classified by Type of School and Time Unit of the Day	109
XXXII.	Contingency Table of Activity Scores in Activity 1 Classified by Age and Time Unit of the Day	110
XXXIII.	Contingency Table of Activity Scores in Activity 7 Classified by Type of School and Time Unit of the Day	111
XXXIV.	Chi Square Test of Difference Between Scores in Activities When Scores Are Classified by Two Variables	114

LIST OF FIGURES

FIGURE	PAGE
I. Hagstrom's Sequence of Events for the School Day	17

CHAPTER I

INTRODUCTION

Hagstrom states, "Professional educators and laymen alike are concerned about the kinds of tasks that teachers should perform" (6, p. 422). Laymen are interested because they pay the teachers' salaries through taxation. Professional educators are concerned because they know the best use of staff personnel is essential if the nation's children are to be well educated. The demand for the best and most efficient use of human resources, which was given impetus by the increasing burden of taxation, has propagated various innovations in staff utilization. One of the more discussed and promoted innovations is team teaching. Proponents of team teaching claim that team teaching, more than conventional teaching, better and more efficiently utilizes staff personnel. Trump contends:

. . . It (team teaching) attempts to use teachers' professional talents better. Teachers now lecture, present, demonstrate, and test in conventional classes an average of about one-half the time they spend with their students . . . (13, p. 329).

If these claims are valid, it would seem that team teaching might be a better approach to the utilization of staff personnel. To determine the validity of the claims made by Trump (13), Beggs (3), Hagstrom (6), and Shaplin (11), an examination of the use of staff personnel seems warranted. A comparison of the activities of team teachers

with the activities of teachers in self-contained classrooms might indicate whether team teaching organization is different from conventional (self-contained classroom) organization in the use of staff personnel.

I. THE PROBLEM

Statement of the Problem

The objective of the study was to determine whether there is a relationship between the structure and organization of a school and the utilization of instructional staff within the school. More specifically the objective was to determine whether teachers in a conventional school and team teaching school differ in the proportion of time they spend on various tasks.

Sub-Problems

When considering teacher use of time, it is obvious that there are variables other than type of school organization which should be considered. Although there is little or no empirical evidence, there is some theoretical evidence supporting the argument that variables such as personal and professional characteristics and time of day may be associated with teacher use of time. This suggests the need for examining a number of sub-problems related to the major problem.

1. Is there a relationship between the personal characteristics of teachers and the percentage of time they

spend performing various activities?

2. Is there a relationship between the professional characteristics of teachers and the percentage of time they spend performing various activities?

3. Is there a relationship between the time of day and the percentage of time spent by teachers on various activities?

Definition of Terms

Team teaching. Shaplin defines team teaching as

. . . a type of instructional organization, involving teaching personnel and the students assigned to them, in which two or more teachers are given responsibility, working together, for all or a significant part of the instruction of the same group of students (11, p. 15).

A more specific and exact definition of the kind of team teaching school involved in the present study is offered by Hillson (7) who refers to a simple type of team teaching called co-ordinate teaching. Co-ordinate teaching is the assignment of two teachers to a large class with both teachers equally responsible for instruction of the class.

Conventional teaching. Conventional teaching is an educational organization wherein teachers work in self-contained classrooms and are responsible for the educational program in a particular class or in a particular subject or subjects.

Personal characteristics. Personal characteristics referred to in this study include age, sex, and marital status.

Professional characteristics. In this study, professional characteristics refer to the field of specialization, years of education, and years of teaching experience.

Time unit. A time unit refers to an arbitrary period of the school day. The school day was divided into five time units:

Time unit 1: 8:55 a.m. to 10:00 a.m.

2: 10:00 a.m. to 11:00 a.m.

3: 11:00 a.m. to 12:00 noon

4: 1:30 p.m. to 2:45 p.m.

5: 2:45 p.m. to 4:00 p.m.

Staff utilization. Castetter notes:

Staff utilization is many things. It is devising ways whereby the ablest teachers can be made available to more students. It is assessing staff competencies and maximizing them for instructional purposes. It is conserving the energies and talents of the staff for genuine educational tasks. It is recognizing staff differences and making teaching assignments accordingly. It is relieving the instructional staff of routine work which can be performed effectively by personnel employed for this purpose, such as clerical and instructional assistants. It is supporting the professional functioning of teachers through greater and more imaginative use of modern technological aids to instruction (4, p. 98).

Staff utilization is a general term which expresses many possible ways of utilizing staff personnel. While staff utilization may consider the use of teacher talents, competencies, and energies, or the tasks performed by teachers, or the number of students taught by the teacher, for purposes of this study staff utilization was narrowed to mean the percentage of time spent by teachers on various activities; for example, conducting routine, controlling,

presenting information, travel, performed throughout the school day.

Activity score. The activity score is the number of times a teacher was observed performing one of the activities. The activity score was expressed in frequency and percentage.

II. IMPORTANCE OF THE STUDY

It seems that some critics of education in each generation--for example, Rickover (10) and Bestor (3) of the present generation--charge educators with inefficient use of time and resources (human and material). Persistently and determinedly, educators have defended and established the value of their occupational activities.

The Rockefeller Report noted:

. . . At the same time that we have forced . . . expansion upon the system, we have pressed our educators to include in the curriculum an incredible variety of subjects, to take over more and more of the functions of the home, and to accept a sense of responsibility for every psychic or civic crisis involving individuals below the age of consent (9, p. 74).

Commencing in the 1950's research began to give concrete evidence of the teachers' utilization of time during the school day. The findings of studies by Christensen (5), The National Education Association (8), and the Bay City Experiment (1), of the fifties, coupled with findings of studies by Hagstrom (6) and Stafford (12) outlined in general how teachers in conventional schools spend their

time.

Because team teaching has not been for long a part of education, there has not been the same opportunity for research on team teachers' utilization of time. There is no published research on time utilization in team teaching schools.

Team teaching is promoted as a partial solution to: the better utilization of teacher talents, the accommodation of students' individual differences, and the redistribution of teacher time spent on activities. According to Hillson, who expresses a consensus of some of the writers, team teaching has the following advantages:

During large group teaching periods other teachers are freed for small group work, lesson planning, and parent-teacher conferences.

Pupils spend more of their school time receiving instruction than when they are in self-contained classrooms.

More extensive use is made of visual aids than would be in self-contained classrooms, wherein the teachers lack the time and sometimes the knowledge to use these resources (7, pp. 165-166).

The present study attempted, on a very limited basis, to investigate whether team-teacher time spent on various activities has been redistributed.

Teacher training institutions which are training teachers for conventional schools might be mistraining teachers who enter team teaching schools. Colleges and universities which train teachers for conventional schools may not adequately be preparing the team teacher who, according to Beggs (2), Trump (13), and Hillson (7), will be

spending different amounts of time on activities common to both types of schools. It seems important that teacher training institutions be cognizant of differences, if indeed there are differences, in teacher time utilization between the two types of schools. While these differences are acknowledged at the theoretical level, they are not yet clearly supported at the empirical level.

Administrators, who are aware of the percentage of time spent by teachers on various activities at different times of the day, might be better equipped to make shifts in the time allotted to various activities. Because teachers spend, on the same activities, different proportions of time in the morning from the afternoon, the administrator might be more able to decide which subjects should be taught in the morning and which should be taught in the afternoon. To know the effect of personal and professional characteristics of teachers on the way they spend their time may be of some assistance when teachers are assigned to particular groups or subjects.

Information about teacher use and distribution of time might serve other purposes as well. It may, for example, enable the administrator to advise and guide the beginning teacher.

III. ASSUMPTIONS

1. It was assumed that teachers provided accurate and correct information on the questionnaire which they were

asked to complete.

2. It was assumed that the observers were accurate and consistent in recording teacher activities.

3. It was assumed that the activity scores in this study were an indication of the proportion of time spent by teachers on various activities during the school day.

4. The presence of observers may have had a direct or indirect effect on the behavior of teachers in this study. It was assumed that the effect on each of the teachers was similar.

IV. LIMITATIONS

1. Because of the size of the sample used in this study, and the uniqueness of each school in regard to its facilities, staff, administration and student population, the findings of this study may not be applicable to other schools.

2. The span of time covered by the study may not give a true cross-section of the teachers' activities throughout the year. Different activities may have been emphasized in October than in May and June.

3. A team teaching addition to the conventional school will open in the fall of 1968. Teachers in the conventional school may, in anticipation, have acquired attitudes and behavior patterns similar to those of team teachers. The attendance, during the last week of the study, of some of the teachers at team teaching preparatory seminars

may have given impetus to the anticipatory socialization of these teachers from the conventional school. Thus, the attitudes developed during the last week of the research for this study might not have been typical for the conventional teachers of the attitudes held earlier, and consequently may have influenced their behavior.

V. DELIMITATIONS

1. The study was restricted to two schools.
2. The study was delimited to the Division II teachers of these two schools.
3. Even though the principals taught part time in Division II, they were not included in the sample.
4. The observation of teachers was restricted to the school hours commencing at 8:55 in the morning and ending at 4:00 in the afternoon. Observations were not made during the lunch period, 12:00 noon to 1:30 p.m.

VI. ORGANIZATION OF THE THESIS

The first chapter introduces the problem, defines terms, attempts to justify the study, establishes restrictions, and indicates some of the limitations which exist within the restricted or delimited area of the study. Chapter II reviews related research and relevant literature and includes a statement of the hypotheses. The instruments used to gather data, the procedure, the treatment of

the data and the tests of significance applied are discussed in Chapter III. In Chapter IV the sample is described. The analyses of the data and discussion of the findings are reported in Chapter V. Chapter VI, the final chapter, presents a summary of the study, conclusions, and implications of the findings.

REFERENCES FOR CHAPTER I

1. "Bay City Experiment," Journal of Teacher Education, 78: 100-142, June, 1956.
2. Beggs III, David W., (ed.). Team Teaching Bold New Venture. London: Indiana University Press, 1966.
3. Bestor, Arthur. The Restoration of Learning. New York: Alfred A. Knopf, 1956.
4. Castetter, William B. Administering the School Personnel Program. New York: The Macmillan Company, 1962.
5. Christensen, Paul E. "Utilization of Professional Manpower in the Teaching Profession." Unpublished Doctoral Dissertation, Wayne University, 1955.
6. Hagstrom, Ellis D. "The Teacher's Day," The Elementary School Journal, 62: 422-431, May, 1962.
7. Hillson, Maurie. Change and Innovation in Elementary School Organization. Chicago: Holt, Rinehard and Winston, 1966.
8. National Education Association. "Teaching Load in 1950." Washington: Research Division of the N.E.A., 29: 4-49, February, 1951.
9. Report of the Panel on Education of Special Studies Project of the Rockefeller Brothers Fund, Inc. "The Pursuit of Excellence: Education and Future of America," from Readings in the Foundations of Education. New York: Crowell Company, 1965.
10. Rickover, H.G. American Education--A National Failure. New York: E.P. Dutton & Co., Inc., 1963.
11. Shaplin, Judson T. and Henry F. Olds, Jr. Team Teaching. New York: Harper and Row, Publishers, 1964.
12. Stafford, Curt. "Teacher Time Utilization with Teacher Aides," The Journal of Educational Research, 56: 82-88, 1962.
13. Trump, Lloyd J. "What is Team Teaching," Education, 85: 327-332, February, 1965.

CHAPTER II

RELATED LITERATURE AND HYPOTHESES

This chapter is divided into five sections. The first section summarizes four studies made on staff and time utilization in conventional or self-contained classroom schools. The purpose, procedure and findings of each study are presented. A theoretical discussion of the relationship between personal and professional characteristics and teacher use of time is presented in section II. The third section reviews from a theoretical viewpoint the influence of a team teaching structure on teacher utilization of time. Section IV includes the hypotheses which the present study has tested. The fifth and final section is a summary which concludes this chapter.

I. TIME UTILIZATION IN CONVENTIONAL SCHOOLS.

The National Education Association (13), on the basis of a study it made in 1951, reported findings in terms of the average number of hours teachers spend per week on various activities. The study was not restricted to regular school hours. Activities were classified under the following categories: (a) class instruction; (b) out-of-class instructional duties such as preparing learning materials and correcting papers; and (c) miscellaneous duties such as study halls, record keeping, coaching athletics, sponsoring

extracurricular activities, and the like.

The study used a questionnaire to gather the data. The 2200 replies used represented 48 states. The data indicated that the average number of hours spent per week by elementary teachers was as follow. In-class instruction--18.3, out-of-class instructional duties--11.9, and miscellaneous--7.7. In terms of percentages, these figures are 59%, 29%, and 16% respectively.

While the study was aimed at determining teacher load, it investigated the time and percentage of time devoted to various teacher activities. With a national average for time spent on the various activities, teachers and administrators could compare the situation in their school with the average.

The Bay City Experiment (3), a five-year cooperative study begun in 1952, reported its findings in terms of in-school teacher activities and out-of-school activities. Fifty-four different activities were performed by the elementary teachers during the regular school day. The in-school activity data were gathered by the following procedure:

. . . A member of the field staff began his day's analysis in the teacher's classroom at fifteen minutes before the opening of the morning session. If a teacher left the room to teach elsewhere, the field staff member timed each activity of the teacher in terms of minutes and fractions of minutes . . . (3, p. 103).

Each teacher, by means of a recording blank, provided the out-of-school activity data. The data collected after the first year from 104 elementary teachers was condensed

into twenty-one categories of teacher activity. The average work week of a teacher was forty-one hours and forty-two minutes. In a week, the elementary teacher spends thirty hours at her work during the school day and eleven hours and forty minutes at her out-of-school activities. Recitation, the largest time consuming teacher activity, ranged from 72 minutes, or 20% of the day, to 174 minutes, or 48% of the day. Directed study ranged from 50 minutes, or 14% of the day, to 84 minutes, or 23% of the day. Miscellaneous activities, many of which do not require professional training or competency, absorb 75 to 249 minutes, or 21% to 69% of the total school day.

One administrative reason for making the above investigation was to produce some techniques and methods which will help school boards and administrators to cope more effectively with excessive enrollments, lack of classrooms, shortage of teachers, and in-service teacher training.

In 1955, Paul E. Christensen made an investigation into the utilization of professional manpower in the elementary teaching profession. He organized his study around thirty-four elements of teacher activity, which he grouped into five sections. His method of obtaining data on the utilization of teacher time was based on the principle of sampling by instantaneous random observations (6). From approximately twenty thousand observations made on twenty-six teachers from one school, the percentage of observations for the five major activities were: individual work--6.8%,

group work--41.1%, supervision--19.8%, conferences--4.7%, and miscellaneous--27.6%.

Christensen's purpose was to gather findings which would suggest ways of improving the utilization of teacher time and contribute to the administrator's knowledge of the work of the teacher.

The present study, which used a methodology of gathering data similar to that used by Christensen, was an extension of his study. The present study, in an attempt to discover whether the type of school organization was associated with teacher use of time, extended Christensen's purpose by considering the type of school organization as a way of improving the utilization of teacher time.

A study made by Hagstrom (11) in 1960 classified the activities of teachers into eighteen categories. This was a one-school study involving twenty teachers. These categories are similar to those used in the present study. Hagstrom used the Activity Sampling method described by Chapanis (5). From the 6,506 samples of teacher behavior or activity, he combined the eighteen categories into eight major groups for purposes of statistical analyses.

The per-cent of occurrence of eight categories of observed activity was: highly skilled behavior requiring interaction with pupils--38%, highly skilled behavior requiring the presence of another adult--5%, highly skilled behavior in solitude--7%, less highly skilled behavior requiring interaction with pupils--11%, less highly skilled

behavior of a technical, supportive nature--12%, pupil transition and control--5%, travel--5%, and miscellaneous--17%.

Hagstrom's study was undertaken to establish a base against which to measure changes in staff utilization practices. Implicit in this was the hope that the data would help educators in differentiating the tasks that require higher levels of preparation and skill from the tasks that require less specialized competence.

An additional aspect of Hagstrom's study was an outline of the sequence of activities of the teachers during an hypothetical, average day near the midpoint of the school year (see Figure I, p. 17). Some conditional factors which should be considered when interpreting the flow charts are as stated by Hagstrom:

Round 3, generally, was made while teachers were greeting pupils and conducting the morning routine. Rounds 6, 7, and 8 either coincided with or partly overlapped the mid-morning recess and lavatory periods. Rounds 11, 12, and 13 were made while varying proportions of the pupils were at lunch or at noon-hour play. End-of-the-day dismissal generally occurred toward the end of the interval during which Round 17 was completed (11, pp. 427, 430).

Because the studies used different activity classifications, it was difficult to determine how closely alike the teachers are in their distribution of time. A comparison of activity classifications which were somewhat alike indicated that teachers differed in their distribution of time.

FIGURE I

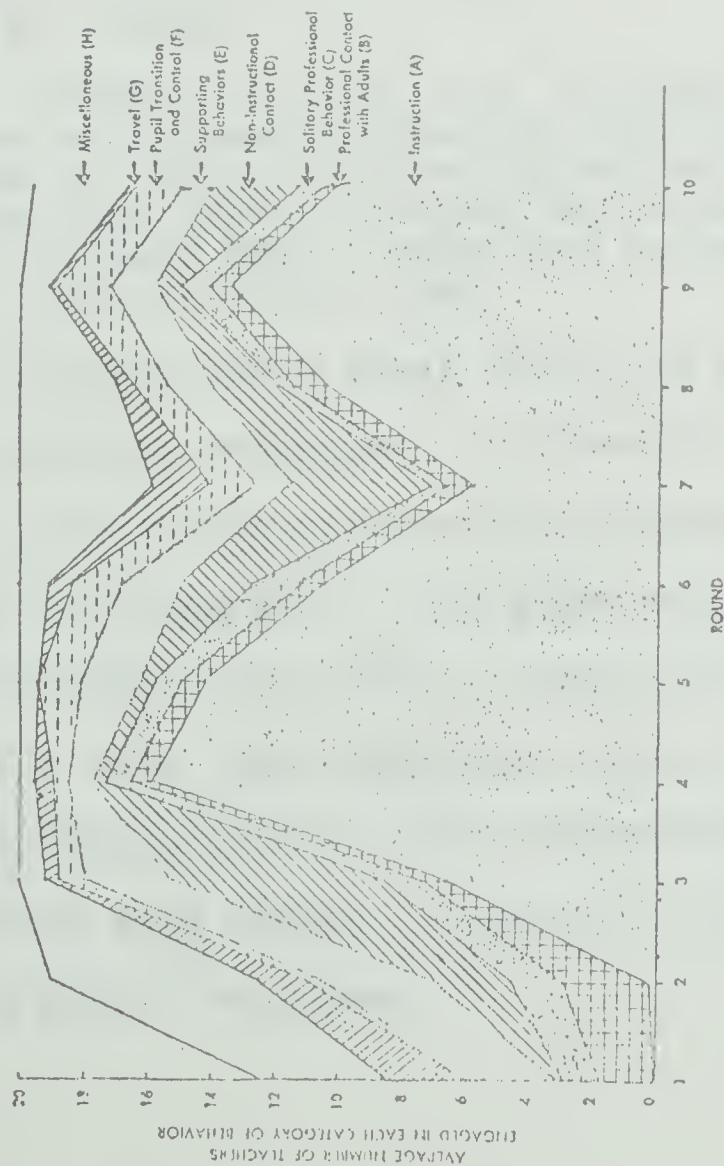


FIG. 1.—Typical morning pattern of teachers' behaviors, based on 3,372 observations.

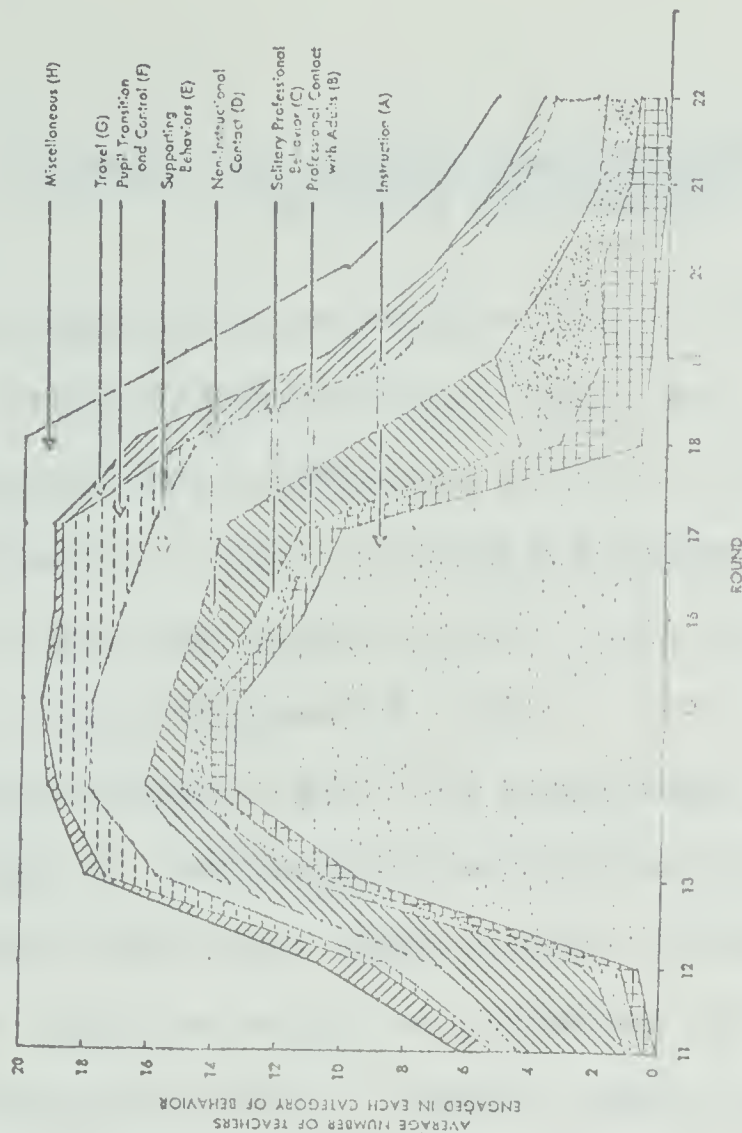


FIG. 2.—Typical afternoon pattern of teachers' behaviors, based on 2,645 observations. Data gathered on afternoons of early dismissal have been excluded.

Source: Ellis A. Hagstrom, "The Teacher's Day," The Elementary School Journal, May, 1962, pp. 428, 429.

II. PERSONAL AND PROFESSIONAL CHARACTERISTICS AND TIME UTILIZATION

There seem to be no studies which definitely suggest that the personal characteristics (age, sex, marital status) and professional characteristics (field of specialization, years of education, years of teaching experience), selected as predictors for the present study, have any influence on the teacher's distribution of time.

The motivation theory, as propounded by Tolman (15), indicates that if individuals have different needs then it seems plausible that they might behave differently. This diversity of behavior might be reflected in the way a teacher distributes his time. Parsons seems in agreement with Tolman when he states:

. . . On the one hand, each individual creates his wants on his own initiative--they are outside the range of "natural" determinism; on the other hand, they are private to each individual. What any one may want has no necessary relation to the wants of others (15, p. 344).

If a teacher has a great need, due to youth, inexperience, or little education, to prove his worth, he might spend more time on activities which he believes will impress his peers or his superiors. One might predict that a man, because he perceives his role as requiring more aggression than a woman's role, may distribute more of his time on exertive activities such as orally presenting information and interacting with adults. Support for this idea is reflected in Duke's statement:

Social pressures and expectations everywhere lead men to take a more active political role than women, and everywhere women tend to be more religious and to take a more "conservative" political position than men, i.e., to follow the class lead less and the religious lead more (9, pp. 24-55).

The reasoning that a teacher's major field of specialization might affect the teacher's time distribution is based on the idea that a person's field of specialization is part of experience. On this point Tolman states:

On the basis of past experience the individual brings a modal belief-value matrix to any new stimulus situation. This modal matrix becomes activated and particularized as a result of the presented environment stimuli and the specific need arousals at the moment. This activated matrix together with the environmental stimuli lead to a particular behavior space (15, pp. 72-73).

The teacher who is teaching subjects outside his field of specialization might spend less time presenting information and possibly more time on supervised studies or personal activities.

According to Costello and Zalkind, Maslow supported the idea of different resultant actions on the part of actors (teachers) even if the needs were the same. Maslow presented three principles which help explain differences found among individuals striving to fulfill their needs.

The same need may lead to different responses. Two individuals experiencing the same needs with equal intensity may use different ways to reach the same goal (for example, trying to get a raise).
 . . .

The same needs may be met by different satisfiers. Hungry people, even in the same family, choose different foods.

Similar behavior may be based on the operation of different needs. Frequently, people are found

in the same office who in one case turn out the work because they seek the admiration of others, and in the other case, because they must meet standards they have set themselves (7, pp. 64-66).

It seems that because individuals portray different behaviors due to the same or different needs, it might be inferred that teachers, who are individuals acting differently from each other, might distribute their time differently on selected activities. On this basis, it seems warranted that the personal and professional characteristics be considered, that is, controlled and accounted for when attempting to discover variables which are associated with teacher distribution of time.

III. TIME UTILIZATION IN TEAM TEACHING SCHOOLS

In the literature, there was no research done on teacher time utilization within team teaching schools. However, it was evident that some proponents of team teaching, Hillson (12), Trump (16), and Beggs (4), claim that team teachers utilize their time more efficiently, and, therefore, distribute their time differently from conventional teachers.

Biologists have proven that humans differ in their physiological makeup; psychologists have proven that humans differ in intelligence and in emotional makeup. Because educators borrow from these fields of study, it seems plausible to suggest that education intentionally strives to meet the needs and demands of the individual. In the present discussion individuals include teachers and students.

Schools are organized to accommodate, to some degree, individual differences among teachers and students. Anderson, Hagstrom, and Robinson offer the following outcome for students in team teaching schools.

The deployment of children in conventional elementary situations is usually a static arrangement, each classroom group remaining intact and usually in the same homeroom throughout the day . . . Under team teaching conditions, a number of more dynamic patterns of deployment and redeployment become possible (1, p. 171).

Trump elaborates on the reorganization of teachers.

Team teaching involves reorganization of instruction. It attempts to use teachers' professional talents better. Teachers now lecture, present, demonstrate, and test in conventional classes an average of about one-half the time they spend with their students. . . . One teacher and the usual thirty students in a "self-sufficient" classroom is not the best setting for discussion and study. Moreover, it is needlessly wasteful of teachers' time and energy for the other activities wherein research shows class size is irrelevant to achieving the instructional purposes involved (16, p. 329).

The reorganization of teachers and students is no more than an attempt to adjust the curriculum to meet more fully group needs and individual needs. Anderson, Hagstrom, and Robinson suggest that team teaching allows and stimulates curriculum change.

In curriculum development . . . the opportunities the team structure offers for reflective and creative work and the challenges provided by the flexibility of the grouping arrangements have dictated a re-examination of the curriculum (1, p. 180).

To establish further the concept that team teaching is conducive to curriculum adaptation, Davis gives support when he says that three questions are imperative in planning for team teaching.

1. What can students learn best from explanations by others?
2. What can students learn by interaction between themselves and their teachers?
3. What can students learn by themselves (8, p. 334)?

The foregoing discussion has attempted to give some evidence that team teaching, a product of the desire to change the curriculum, stimulates curriculum change and adjustment. If, according to Wilhelms, the curriculum is being adjusted to meet individual needs and types of group differences (17, p. 63) then there must be some changes in time utilization. Hillson puts forth the following advantages which claim that time distribution of team teachers is different from that of conventional teachers.

During large group teaching periods other teachers are freed for small group work, lesson planning, and parent-teacher conferences.

Pupils spend more of their school time receiving instruction than when they are in self-contained classrooms.

More extensive use is made of visual aids than would be in self-contained classrooms, wherein the teachers lack the time and sometimes the knowledge to use these resources (12, pp. 166-167).

A similar claim which would imply that team teachers would distribute their time differently is made by Finley. In the following claim, he suggests a distinct advantage of team teaching in the elementary school.

The team makes it possible for more and better planning for the teaching of children. Additional planning time for the members of the team becomes available while one teacher of the team is conducting a large group listening or watching session. This type of program also makes it possible for the non-teaching teachers at this time to work with other small groups or individuals (10, p. 54).

Trump suggests, "Team teaching requires a flexible schedule. Members must decide who does what with which group of students, and also when and for how long" (17, p. 330). This idea seems to indicate that team teachers, being free from the restrictions that are on a self-contained classroom teacher, will undoubtedly distribute their time differently.

Another indirect claim to a difference in time utilization between team teachers and conventional teachers is intimated by Bahner in the following passage:

The desired team operation will capitalize on these different competencies (presenting information to large groups, working with slow groups, motivating students, working with audio-visual aids) of teachers by allocating teachers to groups of pupils in such a way that the specialized talents of each teacher are matched with the teaching task to be accomplished (2, p. 339).

Using Parsons' general theory of organizations, Shaplin develops the following concept:

. . . However, as a result of the transfer of managerial functions to the teachers, there are enormous increases in the amount of time required, for planning, communication among team members, supervision, and evaluation; and these increases quickly absorb any saving of time in other areas . . . (14, p. 72).

Conclusions drawn from this concept would suggest that the distribution of time in a team teaching school should be significantly different from the distribution in a conventional school.

IV. HYPOTHESES

After consideration of the preceding related

literature, the main problem and sub-problems were formulated into positive hypotheses as follows.

The first group of hypotheses considered personal characteristics (age, sex, marital status) which were judged to be related to the percentage of time spent by teachers on various activities. That is, is there any difference in the amount of time teachers spend on various tasks when they are classified by the personal characteristics?

Hypothesis 1.1: Teachers classified on the basis of age differ significantly in distribution of time on various activities during the school day.

Hypothesis 1.2: Teachers classified on the basis of sex differ significantly in distribution of time on various activities during the school day.

Hypothesis 1.3: Teachers classified on the basis of marital status differ significantly in distribution of time on various activities during the school day.

The second group of hypotheses considered professional characteristics (field of specialization, years of education, years of teaching experience) which were deemed to be associated with the percentage of time spent by teachers on various activities.

Hypothesis 2.1: Teachers classified on the basis of field of specialization differ significantly in distribution on various activities during the school day.

Hypothesis 2.2: Teachers classified on the basis of years of education differ significantly in distribution of time on various activities during the school day.

Hypothesis 2.3: Teachers classified on the basis of years of teaching experience differ significantly in distribution of time on various activities during the school day.

The third hypothesis was concerned with the association between the type of school (conventional or team teaching) and the percentage of time spent by teachers on various tasks performed throughout the day. Is there any great difference in the percentage of time spent by teachers on various activities in either type of organization?

Hypothesis 3 : Teachers classified on the basis of type of school differ significantly in distribution of time on various activities during the school day.

Hypothesis four was concerned with the relationship between the time of the day and the percentage of time spent on an activity. Do teachers spend more time on an activity during one part of the day than they spend on that same activity during another part of the day? In other words, does the percentage of time spent on each activity vary according to the time unit or time period of the day?

Hypothesis 4 : Teacher activity patterns differ for various time units of the day.

V. SUMMARY

The first part of this chapter has presented the summaries of four studies which illustrate the use of time in a conventional school. The findings from these studies indicated that elementary teachers are not alike in their distribution of time on teacher tasks.

The second part presented a theoretical or conceptual discussion which intimated that the personal and professional characteristics of teachers might influence the way teachers

spend their time.

Part three reviewed some of the literature which suggests that theoretically team teaching situations or organizations would affect and shift the teacher's emphasis upon certain activities, thereby producing a shift or change in the teacher's distribution of time on tasks performed during the school day.

The hypotheses were stated in positive form in part four. They were grouped into four sections. The first group of hypotheses (1.1), (1.2), and (1.3) dealt with the relationship between the personal characteristics of a teacher and his distribution of time on various tasks performed throughout the day. The second group of hypotheses (2.1), (2.2), and (2.3) was concerned with whether there was a relationship between the professional characteristics of a teacher and his distribution of time on various tasks performed throughout the school day. The third and major hypothesis (3) dealt with the relationship between the type of school and the teacher's distribution of time on various tasks performed throughout the day. Hypothesis four (4) considered the possibility of a significant relationship between the time of the day (time unit) and the distribution of time on various tasks performed during that time interval of the school day.

While there is some empirical evidence on time use in conventional schools, there seem to be no findings on time use in team teaching schools. The literature suggests that

there is, at least theoretically, a difference in time utilization between the two types of schools. Again, although there are no empirical data apparent which indicate the influence of personal and professional characteristics upon the use of time, there are theoretical arguments which indicate that these characteristics have an influence on a person's use of time.

REFERENCES FOR CHAPTER II

1. Anderson, Robert, Ellis A. Hagstrom, and Wade M. Robinson. "Team Teaching in an Elementary School," Change and Innovation in Elementary School Organization, Maurie Hillson, editor. Chicago: Holt, Rinehard and Winston, 1966.
2. Bahner, John M. "Team Teaching in the Elementary School," Education, 85: 337-341, February, 1965.
3. "Bay City Experiment," Journal of Teacher Education, 78: 100-142, June, 1956.
4. Beggs III, David W. (ed.). Team Teaching Bold New Venture. London: Indiana University Press, 1966.
5. Chapanis, Alphonse. Research Techniques in Human Engineering. Baltimore: John Hopkins Press, 1959.
6. Christensen, Paul E. "Utilization of Professional Manpower in the Teaching Profession," Unpublished Doctoral Dissertation, Wayne University, 1955. Dissertation Abstracts, Cushing-Malloy, Inc., Ann Arbor, Mich., Volume XV, p. 1529, 1955.
7. Costello, Timothy W. and Sheldon S. Zalkind. Psychology in Administration. Englewood Cliffs, N.J.: Prentice-Hall Inc., 1963.
8. Davis, Harold S. "Planning for Team Teaching," Education, 85: 333-336, February, 1965.
9. Dukes, William F. "Psychological Studies of Values," Psychological Bulletin, 52, 1955.
10. Finley, Robert M. "How Team Teaching Fits into the Elementary School," Team Teaching Bold New Venture, David W. Beggs III, editor, London: Indiana University Press, 1966.
11. Hagstrom, Ellis D. "The Teacher's Day," The Elementary School Journal, 62: 422-431, May, 1962.
12. Hillson, Maurie (ed.). Change and Innovation in Elementary School Organization. Chicago: Holt, Rinehard and Winston, 1966.
13. "Teacher Load in 1950," National Education Association Research Bulletin. Washington: Research Division of the N.E.A., 29: 4-49, February, 1951.

14. Parsons, Talcott. The Structure of Social Action. Glencoe, Illinois: The Free Press, 1949.
15. Tolman, Edward C. "A Cognitive Motivation Model," Theories of Motivation in Learning, Richard C. Teevan and Robert C. Birney, editors. Toronto: D. Van Nostrand Company, Inc., 1964.
16. Trump, Lloyd J. "What is Team Teaching," Education, 85: 327-332, February, 1965.
17. Wilhelms, Fred T. "The Curriculum and Individual Differences," Individualizing Instruction, 61st Yearbook of the National Society for the Study of Education, Part I, 1962.

CHAPTER III

INSTRUMENTATION, METHODOLOGY, AND TREATMENT OF DATA

I. INSTRUMENTATION

The instruments used to collect data for this study were a brief questionnaire and a data sheet (see Appendix B). The questionnaire, delivered in person, asked each of the teachers and the principals to provide the following information:

- (a) Name
- (b) Age
- (c) Sex
- (d) Marital status
- (e) Years of University and professional education
- (f) Major field of specialization
- (g) Years of teaching experience (including present)
- (h) Teaching assignment (conventional or team teaching)

The data sheet which was used by the observers served as a record for the following information:

- (a) Date (month and day)
- (b) School (by name)
- (c) Starting time and stopping time of each round of observations
- (d) Observer

The major part of the data sheet lists eighteen activities and includes columns for ten teachers. Each data

sheet provides space for the tabulations of three rounds of observations, a round consisting of nine observations, one for each teacher, in the conventional school, or six observations, one for each teacher, in the team teaching school. Upon a very brief or instantaneous observation of a teacher, his activity or behavior at that instant was recorded on the data sheet by checking the appropriate activity category for that teacher (see Appendix A). After one observation of a teacher, the observer proceeded to observe another teacher, and so on. Descriptions of the sixteen activity definitions and two miscellaneous categories follow.

Activities 1, 2, and 3, as defined by Hagstrom, are:

1. Conducting routine. Activities in this category include morning exercises, though the activities may also occur at other times of the day. The teacher is taking attendance; making announcements; distributing report cards or notices; collecting or refunding money; collecting such items as written excuses for absence.

2. Control. The teacher is directing attention to pupil's conduct. Control is the issue; the teacher is asserting his authority over pupils (3, pp. 423-424).

3. Presenting information. The teacher is teaching or tutoring, usually in a formal, structured situation. The teacher is talking, demonstrating, or reading to the class, a group or one individual. The pupils are concentrating on the teacher or on the materials he is presenting. (He is talking while using visual aids).

Hagstrom defined activities 4 through 16 as follows:

4. Instructional supervision. The teacher may be moving from desk to desk, glancing at the pupil's work. He may be looking at or talking with individual pupils engaged in independent work. He may be

administering tests; listening to oral reports by pupils; or supervising activity groups. The focus of attention in the classroom is on the pupil's work or activity; pupils are primarily concentrating on their work.

5. Non-instructional supervision. The teacher is engaged in custodial supervision. He is carrying out the role of the adult responsible for pupils' safety and conduct at bus areas, during recess, in the lunchroom, or during periods when pupils move through the building.

6. Observing. The teacher is in the room with pupils whom another teacher is instructing or supervising. The attention of the observing teacher is the other teacher, the one who is actually teaching or on the total situation. The observing teacher takes no responsibility for the pupils' behavior.

7. Interacting with adults. The teacher is talking with or listening to another adult.

8. Reading. The teacher is reading silently.

9. Creative writing. The teacher is writing. This category includes original, creative composition, but not copy work.

10. Clerical writing. The teacher is copying material on paper, on a stencil, or on the chalkboard at times other than during actual instruction. She is recording marks or attendance, or correcting objective tests.

11. General clerical activity. The teacher is at the files or actually filing, alphabetizing, counting, or sorting report cards or health records; operating a duplicating machine; or assembling and stapling duplicated matter.

12. Materials manipulation. The teacher is transporting, setting up, or operating projectors, players, television sets, or other mechanical devices. As he works he makes no oral comment or explanation. The teacher is distributing or collecting books, workbooks, or other instructional materials (or transporting these items from storage to classroom). He is putting up or taking down displays and decorations. Or he is routinely constructing instructional materials, doing housekeeping chores (aligning desks, cleaning and dusting, erasing board, adjusting shades or windows).

13. Teacher transition. The teacher is changing from one activity to another in his room or at another teaching station. He may be getting things together, straightening up or putting away papers, or getting out materials to begin a new task.

14. Pupil transition. The teacher is in the classroom during the regular session, waiting while pupils prepare for another class or activity. He may be waiting for stragglers to enter the room and take their seats. Pupils may be engaging in such activities as putting away one set of materials and getting out another.

15. Travel. The teacher is walking alone (not transporting materials) from building entrance to the office, from office to room, from room to room.

16. Personal. The teacher is eating alone. He is taking a drink of water, grooming, or putting one or taking off overshoes and outer clothing, sleeping (3, pp. 424-425).

Activities 17 and 18 are defined as follows:

17. No interpretable activity. The observer is unable to describe the teacher's activity in terms of one of the other activities.

18. Unable to observe. The teacher could not be found to be observed. The teacher may have been absent or away from the school building and grounds.

II. METHODOLOGY

Training Period

The two observers practiced observing teacher activities which are defined in this study. First the observers each became familiar with the eighteen categories and their corresponding definitions. Second, after studying the definitions, the observers watched video-tapes on teaching activities. These tapes were provided by the Audio-Visual Department, Faculty of Education, at the University

of Alberta and included activities in team teaching as well as conventional classrooms. The observers watched and discussed for two and one-half hours the teacher activities shown on the video-tapes. After agreement by both observers on each teacher activity, the observers, working separately, practised, with the use of data sheets, recording for two hours their observations of teacher activities presented on the tapes.

For the next two to three training hours, the observers viewed the same video-tape making simultaneous recordings of each designated teacher activity. Each series of recorded observations was started at the same time by both observers, and stopped at the same time by both observers. This practice continued throughout six video-tapes shown during the two and one-half hours. The purpose of this last aspect of the training period was to become consistent at observing to the degree that a minimum reliability coefficient of 0.85 was reached. A reliability coefficient of 0.85 calculated by Scott's method insures the investigator that recorded observations are fairly accurate and consistent. Flanders in relation to verbal interaction suggests, "A Scott coefficient of 0.85 or higher is a reasonable level of significance" (2, p. 15). It was assumed that the level of reliability should be the same for the present study. Comparison of the observations made by the observers in one of the last series of recordings revealed, using Scott's (5) reliability test, a reliability coefficient of 0.93 (see

Table I).

Collection of Data

Teachers, in the sample which is described in detail in Chapter Four, were informed in a group meeting or individually about the general purpose of the study. The activity categories used in the present study were not revealed to the teachers until after the data were gathered.

The principal, vice-principal, and teachers were asked to complete individually a brief questionnaire which supplied predictor data. A sample of the questionnaire is shown in Appendix A.

The procedure used in this study is known as the Activity Sampling Technique which was used in the individual studies made by Christensen and Hagstrom referred to earlier in the related research section of this study. The technique has been used rather extensively in studies which are concerned with efficiency in industry. Chapanis defines the technique in the following way:

. . . Activity Sampling, as the name suggests, means the systematic observation of an operating system through some sort of sampling procedure. The usual purpose of the sampling is to get an accurate description of what an operator or worker does (1, p. 27).

The method is particularly suited for studying complex jobs where the worker performs various activities throughout the day.

A brief description given by Chapanis explains the technique which was used to gather data for the present

TABLE I

CALCULATION OF RELIABILITY COEFFICIENT^a USING PER CENT

Activity Category		Observer A	Observer B	Reliability Coefficient
1.	Conducting routine	0	0	
2.	Control	0	0	
3.	Presenting information	9	8	
4.	Instructional supervision	9	8	
5.	Non-instructional supervision	0	0	
6.	Observing	1	1	
7.	Interacting with adults	2	2	
8.	Reading	0	0	
9.	Creative writing	0	0	
10.	Clerical writing	1	1	
11.	Clerical, general	0	0	
12.	Materials manipulation	3	3	
13.	Transition (pupils)	1	1	
14.	Transition (teacher)	1	1	
15.	Travel	1	1	
16.	Personal	0	0	
17.	No interpretable activity	0	0	
18.	Unable to observe	0	0	
TOTAL	18	28	26	.93

^aReliability coefficient: calculated by Scott's method.

study.

The basic technique for this kind of activity sampling is quite simple. The observer has a timing mechanism (wrist watch) of some sort. At certain predetermined times the observer records what the worker is doing at that instant. The recording is usually on a specially prepared report form, When the data are all in, the investigator can then get an estimate of (a) the percentage of the worker's total time spent in various activities, (b) the average length of time spent in each activity, and (c) the sequence in which the worker performs various parts of his job (1, p. 27).

The activity of each teacher at the instant the observer encountered him was recorded in terms of one of the eighteen activity categories on the data sheet. An observer would begin a round of observations by observing a teacher who had not been observed first in the preceding round. This procedure was followed in an attempt to randomize the order of observations from one round to the next. The observer would make an instantaneous observation (approximately five seconds) of the activity being performed by the teacher, almost regardless of the place or type of activity being performed. Immediately the observer would check under that teacher's column on the data sheet the appropriate activity category. After each observation the observer proceeded to observe another teacher. This succession of observations continued throughout the school hours. The observations were made during the three-week period beginning on April 29, 1968, and ending on May 17, 1968.

In order to obtain approximately the same number of observations per teacher, the observers recorded the activity of one teacher, then observed another teacher, and so on.

This prevented an unequal frequency count of observations for any one teacher. While an effort was made to obtain approximately the same number of observations per teacher, there was also an effort made to obtain nearly the same number of observations (per teacher) for each hour of the school day. Because the fourth and fifth time units each consisted of one hour and fifteen minutes, these two time units required a greater number of observations than did time units 1, 2, and 3.

The observers worked, whenever feasible, in different schools. For example, in the morning observer A worked in the one conventional school and observer B worked in the one team teaching school; during the lunch hour the observers alternated so that in the afternoon observer A worked in the team teaching school and observer B worked in the conventional school.

Since the primary objective of this study was to discover teacher distribution of time, or the percentage of observed time the teacher spent on activities, random sampling intervals (the time between successive observations) were used. According to Heiland and Richardson, random sampling intervals can be used when the investigator is interested only in the distribution of time (4).

On the tenth day of data collection, a reliability check was made. Both observers worked together recording at a signaled moment, the activity of the teacher under observation. Using Scott's method, a reliability coefficient of 0.90 was obtained (see Table II).

TABLE II

CALCULATION OF RELIABILITY COEFFICIENT USING PER CENT

Activity Category	Observer A	Observer B	Reliability Coefficient
1 ^a	0	0	
2	1	1	
3	22	24	
4	16	14	
5	6	8	
6	6	6	
7	5	5	
8	2	2	
9	0	0	
10	0	0	
11	8	7	
12	0	0	
13	0	0	
14	2	2	
15	25	24	
16	1	1	
17	0	0	
18	0	0	
TOTAL	18	94	.90

^aSee Table I, page 36, for activity names.

III. TREATMENT OF DATA

The data collected during the three weeks' research included (1) responses from fifteen teachers to the questionnaire, and (2) a total of 5,477 observations. Additional information includes a description of the school buildings, an outline of the subjects taught, and facts about the student body.

Coding and Punching

The data were transcribed from the original data collection sheets onto IBM sheets. The procedure for coding the frequency data assigned an IBM card to the observations made on one teacher during one time unit of the day. On each data card in a two-digit number was stated each activity category number of the activities performed by a teacher during that time unit of the day. The teacher's assigned number, the day, and the time unit were punched on each card.

A master card was punched for each teacher. This card contained general information pertaining to the teacher, namely, the type of school in which the teacher worked; the teacher's age, sex, and marital status; the teacher's field of specialization, years of education, and years of teaching experience.

Descriptive Analysis of Activity Data

In the data gathering, each of the 5,477 observations was classified by the observer into one of the eighteen activity categories. The largest numbers of observations

recorded fell into activity categories entitled: Presenting information (3), ranking first; Instructional supervision (4), ranking second; Unable to observe (18), ranking third; Travel (15), ranking fourth; Interacting with adults (7), ranking fifth; and Non-instructional supervision (5), ranking sixth. The smallest numbers of observations recorded were found in categories entitled: Conducting routine (1), ranking fourteenth; Observing (6), ranking fifteenth; Clerical work (11), ranking sixteenth; Creative writing (9), ranking seventeenth; and No interpretable activity (17), ranking eighteenth. The distribution of observations made in each activity for all teachers and for all teachers when they were separated by school type is shown in Table III.

The activity scores in each activity category when teachers were classified by personal characteristics and professional characteristics are shown in Tables IV and V respectively.

The distribution of observations by activities, when observations are classified by the time unit of the day, is presented in Table VI.

Procedure Used in Testing the Hypotheses

The programming required before and during the testing of the hypotheses is outlined as follows:

1. A program which provided ninety summary cards, six for each teacher. The total number of observations for each activity performed by the teacher was stated on five of these summary cards, one for each time unit of the day. The

TABLE III

ACTIVITY SCORES IN PERCENT ON EIGHTEEN ACTIVITIES
WHEN TEACHERS ARE CLASSIFIED BY SCHOOL
AND BY TOTAL SAMPLE

Activity Category	Conventional School		Team Teaching School		Both Schools	
	Percent	Rank	Percent	Rank	Percent	Rank
1 ^b	2	12	1	16	2	11
2	3	8	2	12	1	11
3	26	1	25	1	26	1
4	22	2	24	2	23	2
5	7	4	5	5	6	5
6	0	18	4	6	1	15
7	5	6	8	3	6	5
8	2	12	2	12	2	11
9	0	17	0	17	0	17
10	3	8	2	12	3	8
11	0	16	3	9	1	15
12	5	6	4	6	5	7
13	3	8	3	9	3	8
14	3	8	4	6	3	8
15	7	4	6	4	7	4
16	2	12	2	12	2	11
17	0	15	0	17	0	17
18	10	3	3	9	8	3
TOTAL ^a	100		98		100	
Number of Observations	3335		2141		5477	

^aTotal: does not equal 100 because percentages were rounded off.

^b₁: See Table I, page 36, for activity names.

TABLE IV

ACTIVITY SCORES IN PERCENT IN EACH ACTIVITY WHEN TEACHERS
ARE CLASSIFIED BY AGE, SEX, AND MARITAL STATUS

Activity Category	Age Groups ^a			Sex		Marital Status	
	1	2	3	Male	Female	Single	Married
1 ^c	2	1	1	2	2	1	2
2	2	1	4	2	3	2	3
3	30	26	21	26	26	26	25
4	19	28	24	24	22	26	22
5	6	6	6	7	6	5	7
6	0	3	2	1	2	3	1
7	5	8	5	7	5	6	6
8	2	2	2	2	2	2	2
9	0	0	1	0	0	0	0
10	3	2	3	2	3	2	3
11	1	1	2	1	2	1	2
12	6	4	5	5	5	5	5
13	3	3	3	2	3	4	2
14	3	4	4	3	3	3	3
15	6	7	7	7	7	7	7
16	2	2	2	2	2	2	2
17	0	0	0	0	0	0	0
18	11	3	8	8	7	4	10
TOTAL ^b	100	100	100	100	98	100	100
Number of Teachers	5	5	5	7	8	5	10

^aAge groups: (1) 20-24 years of age; (2) 25-26 years of age; (3) 27+ years of age.

^bTotal: Some do not equal 100 because numbers in column were rounded off.

^c1: See Table I, page 36, for activity names.

TABLE V

ACTIVITY SCORES IN PERCENT IN EACH ACTIVITY WHEN TEACHERS
ARE CLASSIFIED BY FIELD OF SPECIALIZATION, YEARS OF
EDUCATION, AND YEARS OF TEACHING EXPERIENCE

Activity Category	Field of Specialization Groups ^a			Years of Education Groups ^b			Years of Teaching Experience Groups ^c		
	1	2	3	1	2	3	1	2	3
1 ^d	2	1	1	2	1	2	2	1	1
2	2	3	2	3	3	2	3	1	1
3	27	23	28	28	28	21	29	24	22
4	22	24	25	17	25	25	21	26	23
5	6	6	6	0	5	0	6	7	6
6	1	3	0	2	2	0	0	1	4
7	8	4	7	6	6	6	5	8	6
8	2	3	1	2	1	2	2	2	2
9	0	1	1	0	0	1	0	0	1
10	3	3	3	3	3	2	3	2	3
11	2	1	0	0	1	3	0	1	3
12	6	4	4	6	4	5	4	6	5
13	3	3	3	3	3	3	3	3	3
14	3	3	4	3	3	3	3	3	4
15	6	7	9	7	7	6	7	6	7
16	2	2	2	2	2	2	2	2	2
17	0	0	0	0	0	0	0	0	0
18	5	12	3	9	4	10	10	6	6
TOTAL	100	100	100	100	100	100	99	99	99
Numbers of Teachers	7	6	2	4	6	5	6	4	5

^aField of Specialization Groups: (1) English, Reading, Elementary Library, French; (2) Social Studies, Political Science; (3) Mathematics, Science.

^bYears of Education Groups: (1) 0-3 years of education; (2) 4 years; (3) 5 years.

^cYears of Teaching Experience Groups: (1) 0-2 years of experience; (2) 3-7 years; (3) 8+ years.

^d1: See Table I, page 36, for activity names.

TABLE VI

ACTIVITY SCORES (FREQUENCY) IN EACH ACTIVITY WHEN SCORES
ARE CLASSIFIED BY THE TIME UNIT OF THE DAY

Activity Category	For Total Time Units	Time Unit and Rank									
		1 ^a		2		3		4		5	
		F ^b	R	F	R	F	R	F	R	F	R
1 ^c	14	25	10	9	15	12	14	26	11	15	14
2	11	22	11	17	12	27	11	28	10	34	9
3	1	303	1	231	1	256	2	307	2	304	1
4	2	221	2	166	2	303	1	308	1	271	2
5	6	50	6	59	6	69	4	98	3	61	5
6	15	14	14	13	14	26	12	24	13	5	16
7	5	54	5	104	3	23	13	57	6	94	4
8	13	18	13	15	13	28	10	24	13	14	15
9	17	6	16	1	17	1	17	10	16	3	17
10	10	29	8	35	9	29	9	32	9	27	11
11	16	12	15	4	16	7	16	25	12	25	13
12	7	49	7	54	7	33	8	77	5	55	7
13	9	22	11	32	10	37	6	37	8	32	10
14	8	27	9	32	10	41	5	40	7	38	8
15	4	63	4	69	5	34	7	98	3	108	3
16	12	4	17	43	8	9	15	18	15	26	12
17	18	0	18	1	17	0	18	4	17	0	18
18	3	78	3	101	4	92	3	84	4	58	6
TOTAL		997		986		1027		1297		1170	

^a(1): 8:55 - 10:00 a.m.
 (2): 10:00 - 11:00 a.m.
 (3): 11:00 - 12:00 noon

(4): 1:30 - 2:45 p.m.
 (5): 2:45 - 4:00 p.m.

^bF: Frequency R: Rank

^c1: See Table I, page 36, for activity names

sixth card for each teacher indicated the total number of times the teacher performed each activity throughout the day for the fifteen days.

2. The second program converted the frequency scores on the summary cards to percentage scores in order to facilitate comparisons between teachers since each teacher was not observed the same number of times.

3. A program to:

- a. apply chi square tests to the activity scores for the purpose of determining whether there is a significant difference between distribution of scores for all activities under the various classifications;
- b. apply Mann-Whitney U or Kruskal-Wallis tests to activity scores for the purpose of determining whether there is a significant difference between scores in each activity under the classifications which yielded significant chi squares; and
- c. compare two at a time and test for significant differences any of the variables which showed significant differences from the Mann-Whitney U test.

The third program, while adjusting percentage scores to compensate for the different number of teachers in each school, applied in each classification a chi square test to determine if there was a difference between distributions of activity scores when teachers were classified by type of school, age, sex, marital status, field of specialization, years of education, and years of teaching experience. The same chi square program was applied to determine whether there was a difference between proportions for all activities

when the observations were classified according to the time unit in which they were made.

If the chi square test indicated a significant difference between any of the distributions, at the .05 level of significance or higher, a Mann-Whitney U test was used to determine which of the eighteen activities accounted for the difference. This test compared the eighteen activities, one at a time, whenever two classifications only were being compared as they were for type of school, sex, and marital status.

Whenever classifications resulted in three or more groups the Kruskal-Wallis test was used. This test was applied for testing significant differences between categories based on age (3 groups), field of specialization (3 groups), years of education (3 groups), years of teaching experience (3 groups), and time unit of the day (5 categories).

Whenever the Mann-Whitney U test or the Kruskal-Wallis test indicated a significant difference between scores on an individual activity under more than one classification, a chi square test was applied to the scores on the basis of a two variable classification. For example, was there a difference between scores when teachers were classified by both type of school and age? An example of a contingency table for these two variables in one activity follows.

SCORES CLASSIFIED BY TYPE OF SCHOOL AND AGE OF TEACHER

		Type of School	
		Conventional	Team Teaching
Age	18-24		
	25-26		
	27 +		

Two-way classifications such as the example above help pin-point the source of any differences found. In the above example, findings would indicate whether there was a difference in the distribution of observations between any of the six groups of teachers represented by the six cells of the contingency table.

IV. SUMMARY

This chapter discussed the instrumentation, and explained the methodology, and treatment of data. Section one described the questionnaire used to gather personal and professional data on each teacher and to identify the type of school in which he taught, and the instrument used to record the observations. This latter instrument (called the data collection form) indicated the date, school, starting and stopping time of each round of observations, and the name of the observer. In this section each of the eighteen

activity categories was defined.

Section two explained the training undertaken prior to the actual collection of data by both observers and discussed the Activity Sampling Method used in data collection. This procedure required each observer to be familiar with the activities listed on the data collection sheet. The collection of data was randomized by using random intervals between rounds, and by beginning each succeeding round of observations with a different teacher. Approximately equal numbers of observations per teacher for each time unit of the day were collected.

The third section of this chapter briefly discussed the procedure used in coding the data and the method used in transferring the data onto cards. Next, a descriptive analysis of the data based on summaries of the information on the cards was presented. This analysis revealed the number of observations made and the pattern of distributions over the activities when teachers were classified by type of school, and by personal and professional characteristics; and when observations were classified by the time unit of the day.

The last part of section three outlined and described the statistical procedures used in testing the hypotheses. The tests of significance used included the chi square, the Mann-Whitney U and, if chi square was significant, either the Mann-Whitney U or the Kruskal-Wallis test was used, depending on the number of classifications; and, if significant

differences on the same activity category were found on more than one variable, these variables were compared two at a time using the chi square test again.

REFERENCES FOR CHAPTER TII

1. Chapanis, Alphonse. Research Techniques in Human Engineering. Baltimore: John Hopkins Press, 1959.
2. Flanders, Ned A. Interaction Analysis in the Classroom. University of Michigan, January, 1962.
3. Hagstrom, Ellis D. "The Teacher's Day," The Elementary School Journal, 62: 422-431, May, 1962.
4. Heiland, R.E. and W.J. Richardson. Work Sampling. New York: McGraw-Hill, 1957.
5. Scott, W.A. "Reliability of Content Analysis: The Case of Nominal Scale Coding," The Pub. Opinion Q., 1955.

CHAPTER IV

DESCRIPTION OF SAMPLES

The purpose of this chapter is to describe the schools involved in this study, and present in tabular form the data collected by means of the questionnaire and the observations.

I. PERSONAL CHARACTERISTICS OF TEACHERS

Information about the personal characteristics of teachers in the sample (age, sex, marital status) was obtained from the questionnaires.

Age

The fifteen teachers ranged in age from twenty to fifty-five years. Teachers in the conventional school ranged in age from twenty to forty-one years and the team teachers ranged in age from twenty-five to fifty-four. There were nine teachers in the age group twenty to twenty-six, two in the age group thirty-one to thirty-two, two in the age group forty-one to forty-eight, and one who was older than fifty. The ratio of teachers in their twenties was the same in both schools; six of the nine teachers in the conventional school and four of the six teachers in the team teaching school were in their twenties. The three teachers older than forty were women. Age distributions by school are summarized in Table VII.

TABLE VII
DISTRIBUTION OF TEACHERS BY AGE

Teachers Assigned Number	Age Classifications		
	20-24	25-26	27 +
1)	x		
2)	x		
3)	x		
4)	x		
5) ^a			x
6)			x
7)			x
8)	x		
9)		x	
10)			x
11)		x	
12) ^b			x
13)		x	
14)		x	
15)		x	
TOTAL 15	5	5	5

^aRespondents numbered one through nine were in the conventional school.

^bRespondents numbered ten through fifteen were team teaching teachers.

Sex

There was a total of seven male teachers and eight female teachers in the sample. Of the nine teachers in the conventional school four were male and five were female. While the oldest teacher was female, three of the five teachers in the age range twenty to thirty were women.

In the team teaching school, three of the six teachers were female. Two of the three female teachers were older than forty-five. The three male team teachers were under twenty-seven years of age. See Table VIII for the sex distribution of teachers.

Marital Status

Seven of the nine teachers in the conventional school were married and two were single. The two single teachers were both female, and twenty-three and thirty-two years of age. Four of the seven married teachers were female.

In the team teaching school three of the six teachers were single, one was married, one was divorced, and one was widowed.

Two of the three single teachers were male while the widowed teacher and the divorced teacher were female. See Table IX for the marital status of teachers.

II. PROFESSIONAL CHARACTERISTICS OF TEACHERS

The questionnaires furnished information about the professional characteristics (field of specialization, years

TABLE VIII

DISTRIBUTION OF TEACHERS BY SEX

Teacher number	Male	Female
1		x
2	x	
3	x	
4		x
5		x
6		x
7	x	
8		x
9	x	
10		x
11	x	
12		x
13	x	
14		x
15	x	
TOTAL 15	7	8

TABLE IX

DISTRIBUTION OF TEACHERS BY MARITAL STATUS

Teacher number		Single	Married	Widow	Divorced
	1		x		
	2		x		
	3		x		
	4	x			
	5		x		
	6	x			
	7		x		
	8		x		
	9		x		
	10			x	
	11		x		
	12				x
	13	x			
	14	x			
	15	x			
TOTAL	15	5	8	1	1

of education, years of teaching experience) of teachers.

Field of Specialization

In the conventional school, four teachers had fields of specialization in language arts, four in social sciences, and one in math-science, as specified in the questionnaire each teacher completed (see Appendix A).

In the team teaching school, three teachers had specializations in language arts, two in social sciences, and one in math-science.

Table X illustrates the number of teachers in each category of specialization, and the subjects included in each classification.

Years of Education

In the conventional school the Division II staff consisted of two teachers each with two years of education, one with three years, three each with four years of education, and three teachers each with five years of education. Of the six teachers with four and five years of education, four were female.

Within the team teaching school, one teacher had two years of education, three had four years, and two had five years of education.

Table XI presents the number of years of education each teacher had.

Years of Teaching Experience

In the conventional school, five teachers had one or

TABLE X

DISTRIBUTION OF TEACHERS BY FIELD OF SPECIALIZATION

Teacher Number	Specialization Classifications		
	1 ^a Language Arts	2 ^b Social Science	3 ^c Math-Science
1	x		
2	x		
3		x	
4	x		
5		x	
6		x	
7			x
8	x		
9		x	
10		x	
11			x
12	x		
13	x		
14		x	
15	x		
TOTAL 15	7	6	2

^a1: Language Arts includes such fields of specialization as English, Reading, Elementary Education, Librarianship, French.

^b2: Social Science includes such fields of specialization as Social Studies, Political Science, and Social Science.

^c3: Math-Science includes such fields of specialization as Mathematics and Science.

TABLE XI

DISTRIBUTION OF TEACHERS BY YEARS OF EDUCATION

Teacher number	Years of Education ^a				
	1	2	3	4	5
1		x			
2		x			
3					x
4			x		
5				x	
6				x	
7					x
8				x	
9					x
10		x			
11				x	
12					x
13					x
14				x	
15				x	
TOTAL 15	0	3	1	6	5

^aYears of education: Indicates the number of years of education or teacher training beyond high school.

two years of teaching experience, two teachers had three to five years, and two had six to eleven years of experience. Of the five having one or two years of experience, four were under twenty-five years of age and one was over forty.

On the team teaching staff, one teacher had one or two years of experience, two had three to five years of experience, and three teachers had six to eleven years of experience.

Table XII presents a distribution of years of teaching experience found among the teachers.

III. DESCRIPTION OF THE TWO SCHOOLS

Location, size, age, layout, principals, and departmentalization of the schools were discussed because they may have had an effect on teacher use of time. For example, the size of the school may have some influence on the amount of time a teacher spends traveling from the library to his teaching area, or the principal may be the type of person or administrator who has made school policies which effect teacher use of time.

Location

The two schools were located in west Edmonton, Alberta. Both schools serve suburban residential area.

Size and Age of Schools

The conventional school, approximately twelve years

TABLE XII

DISTRIBUTION OF TEACHERS BY YEARS OF TEACHING EXPERIENCE

Teacher Number	Years of Experience ^a		
	(1 - 2)	(3 - 5)	(6 - 11)
1	x		
2	x		
3	x		
4	x		
5	x		
6			x
7			x
8		x	
9		x	
10			x
11	x		
12			x
13		x	
14			x
15		x	
TOTAL 15	6	4	5

^aYears of Experience: Refers to the number of years of teaching experience.

old, had a total student enrolment of 640. Division I had a total of 345 students and Division II had 295 students. There were 24 teachers on staff in the conventional school, nine of whom taught in Division II. All nine Division II teachers in the conventional school were observed for purposes of the present study.

The team teaching school, approximately two years old, had a total enrolment of 401 students. There were 211 students in Division I and 190 in Division II. The team teaching school staff was comprised of 15 teachers, six of whom taught in Division II. All six Division II teachers in the team teaching school were observed for purposes of this study.

Layout

The conventional school was a two-storey rectangular structure (see Appendix B) with classrooms on both floors. Each floor had a central hallway with classrooms on each side. Some of the classrooms used by the teachers observed in this study were on the south end of the second floor. In this same area of the second floor were the staff lounge, restrooms, and a work room where duplicators, and audio-visual equipment were found and where paper was stored. Stairways and exits from the school were located in the middle and at both ends of the 250-foot long building. The gymnasium was located in an extension off the first floor. The library was near the north end of the building and on the first floor. Two classrooms used by teachers in the

sample were near the library. Two portable classrooms located within a few feet of the south entrance to the school were also used by teachers in the sample. Central office was near the middle of the first floor.

The team teaching school was a one-storey circular structure (see Appendix B) with individual classrooms occupying two-thirds of the building. The open area, called the cooperative teaching area, encompassed about one-third of the building. Located within the open area were the library, the audio-visual storeroom, and enough desks to accommodate all the students and teachers in Division II. The staff lounge, restrooms, and central office were located within a few feet of the open area. The gymnasium was in an extension to the school on the side of the building opposite to the open area.

Principals

The principals' questionnaires revealed that both were over fifty but under fifty-five years of age. The two principals were male and married. The principal of the conventional school reported that his major field of specialization was educational psychology, while the principal of the team-teaching school reported that his major was mathematics and science. The principal of the conventional school had six years of education and twenty-one years of administrative experience. The team-teaching school principal had five years of university education, and ten years of administrative experience. The principal of the conventional

school had been in his present school for two years. Both principals taught part time in Division II.

Departmentalization

In Division II of the conventional school, teachers moved from classroom to classroom where they taught the same or different subjects. While the teachers moved in a somewhat departmentalized fashion, the students did not move to other classrooms after each period. Although teachers taught more than one subject throughout the day, the subjects they did teach were related to their major field. Also, the teachers spent more time throughout the day with their home-room class.

The teachers in Division II of the team-teaching school moved between periods to other teaching stations or rooms. These teachers taught different classes and different subjects throughout the school day, but tended to teach in their major fields. Students in the team-teaching school moved to large or small groups depending on the plan for that period. The team organization usually consisted of not more than two teachers. If two classes of children were amassed in a large group, one teacher presented the lesson, and the other teacher helped with discipline, individual assistance, or listened to the presenting teacher.

IV. TIME PERIODS OF THE SCHOOL DAY

The school day, beginning at 8:55 a.m. in the team-

teaching school and at 9:00 a.m. in the conventional school and dismissing at 4:00 p.m. in both schools, was divided into five time intervals or time units for purposes of this study. The first time unit, 8:55 a.m. and 9:00 a.m. to 10:00 a.m., included morning exercises and routine which were performed for two or three minutes at the beginning of the period. The remainder of this time period was usually filled with regular teaching with the exception of a subject change at 9:30 a.m. Most teachers in both schools moved to different classes (rooms or stations), but the students typically did not move to different rooms or areas. During the next time unit, teaching usually took place until 10:30 a.m. Recess lasted from 10:30 a.m. to 10:45 a.m. in both schools. During recess, one or two teachers were out on the playground, while the majority of the remainder patronized the staff lounge. Usually, the first five minutes after the recess were used to settle students and teachers. The final ten minutes of that time unit were used for regular teaching. Since students and teachers changed classes during the recess interval, the third hour of the day, in both schools, involved teaching until 11:45 a.m. at which time subjects were changed, but no movements of teachers or students occurred. School was dismissed for lunch at 12:00 noon. There were no observations recorded during the lunch break which ended at 1:30 p.m. Time unit four began at 1:30 p.m. and ended at 2:45 p.m. Teaching occurred during this time unit except for a subject change by students who did not

move and a class change for most teachers who were required to move to a different room or teaching station. The fifth time period, beginning at 2:45 p.m., consisted of fifteen minutes of recess which lasted until about 3:00 p.m. For the last hour of this time unit teaching ensued. School was dismissed at 4:00 p.m. at which time observations ceased.

V. SUMMARY

Section one of the present chapter presents in tabular form and in writing the personal characteristics of the teachers observed in this study.

The second part of the chapter explains with the use of tables the professional characteristics of the teachers.

Because certain aspects of the school may have some influence on the way a teacher uses his time, these aspects such as location, size, and layout were discussed in section three. While the two schools were in the same area, one was a little larger and older than the other. The layout (floor plan) of the conventional school was very much different from that of the team teaching school. This difference in layout is the basis in part of the third hypothesis in this study. Additional information presented includes a brief comparison of the two principals. While the principals were similar in most characteristics included in the questionnaire, they were different in some respects. This may have had some effect on teacher behavior but no attempt was made

in the study to identify these.

Section four describes the average school day by dividing it into the five time units used in recording the data. The unique aspects of each time unit are presented. For example, recesses occurred during the second and fifth time units. During time units one and five teachers moved to make subject changes.

CHAPTER V

STATISTICAL ANALYSIS OF DATA AND RESULTS

This chapter analyzes the data gathered from observations made on fifteen teachers, by classifications based on teacher responses to the questionnaire, and by the five arbitrary divisions of the school day.

The hypotheses are discussed individually. The findings, a discussion, and a conclusion are presented for each hypothesis. The findings are presented in tabular form, and the results based on chi square, Mann-Whitney U (for two groups) and Kruskal-Wallis (for three or more groups) tests of significance are discussed. For purposes of this study the tables in Ferguson (1, p. 407) and Hays (2, pp. 675-676) were used for determining critical values of chi square at various levels of significance. Tables in Siegel (3, pp. 271-277) were used to determine critical values of U (Mann-Whitney U test) at various levels of significance. Tables in Siegel (3, pp. 282-283) and Ferguson (1, p. 407) were used to determine critical values of H (Kruskal-Wallis One-way Analysis of Variance by Ranks) at various levels of significance.

As described in Section III of Chapter III, the procedure used in testing the hypothesis involved first the application of chi square to the distribution, over eighteen activities, between each of the various classifications. If

chi square indicated no significant difference between distributions, the positive hypothesis was rejected. When the chi square test indicated a significant difference between distributions, the second step, which applied the Mann-Whitney U test or the Kruskal-Wallis test, was applied. If either of these tests suggested a significant difference between scores on one or more of the activities, under each classification, the positive hypothesis was partly accepted. The findings from the Mann-Whitney U or Kruskal-Wallis are presented in tabular form and discussed.

The next step in the analysis of the data involved the application of chi square tests to determine if the variables of those classifications which had significant differences between the scores in the same individual activities were independent of each other. Are type of school, age, and time unit independent of each other in the percentage of time spent by teachers in activity (1) Conducting routine? Are type of school and time unit independent of each other in the percentage of time devoted to activity (7) Interacting with adults?

I. A COMPARISON OF TEACHER ACTIVITIES WHEN TEACHERS ARE CLASSIFIED BY AGE, SEX, AND MARITAL STATUS

Hypotheses 1.1, 1.2, and 1.3 are discussed in this section. These hypotheses were concerned with determining whether there was an association between the activities of teachers and selected personal characteristics of teachers.

Do young teachers devote a greater or smaller percentage of their time to the activities under study? Do male teachers, compared to female teachers, spend a different proportion of their time on certain classroom activities? Do married teachers and single teachers differ in the distribution of time to individual activities?

Hypothesis 1.1: Teachers classified on the basis of age differ significantly in distribution of time on various activities during the school day.

Results

A chi square value of 73.4 or more would occur with probability of .001 in a distribution with 34 degrees of freedom. Since the calculated value of chi square for age distributions was 298 (see Table XIII), the hypothesis was not rejected. The chi square indicated that teachers classified by age differ significantly on their distribution of activity scores. The Kruskal-Wallis test was applied next to determine whether the hypothesis was partly or completely accepted.

The Kruskal-Wallis test revealed that teachers differ significantly on the scores in three activities. In activity (1), Conducting routine, a probability of .01 was associated with the calculated H value of 10. The H value of 9.0 calculated in activity (2), Control, was enough greater than the required H value of 8.0 to be associated with a probability of .02. The Kruskal-Wallis test,

TABLE XIII

CHI SQUARE TEST OF THE DIFFERENCE BETWEEN DISTRIBUTIONS OF ACTIVITY
SCORES WHEN TEACHERS ARE CLASSIFIED BY AGE (YEARS)

Activity Category	Observed Frequencies			Expected Frequencies		
	20-24	Rank	25-26	Rank	27 or more	Rank
1 ^a	43	11	19	15	25	16
2	34	12	19	15	75	8
3	551	1	470	2	380	2
4	345	2	495	1	429	1
5	114	15	110	5	113	5
6	1	17	48	10	33	14
7	100	7	139	3	93	6
8	33	13	37	11	29	15
9	4	16	4	17	13	17
10	59	8	34	12	59	11
11	9	15	20	14	44	12
12	114	5	72	6	82	7
13	48	10	52	9	60	10
14	50	9	63	7	65	9
15	118	4	126	4	128	4
16	30	14	31	13	39	13
17	2	18	1	18	2	18
18	203	3	59	8	151	3
TOTAL						
				1858	1799	1820

The chi square of 298 with 34 degrees of freedom was significant at the .001 level of significance.

^a1: See Table I, page 36, for activity names.

when applied to the scores in activity (3), Presenting information, produced an H value of 7.2. This H value is associated with a probability of .05 (see Table XIV).

Discussion

In activity (1), Conducting routine, group I (aged 20 through 24 years) had an observed activity score of 43 with an expected score of 31; group II (aged 25 through 26 years) had an observed activity score of 19 with an expected score of 29; group III (aged 27 or more years) had an observed activity score of 25 with an expected score of 29. These scores indicate that younger teachers spend a greater percentage of their time than either the other groups spend on activity (1). While it may be suggested that because younger teachers lack experience they devote a greater percentage of their time to conducting routine, teachers classified by teaching experience did not differ significantly on scores in this activity. That is, teachers who lack teaching experience do not seem to devote more time than teachers who have teaching experience to activity (1), Conducting routine. Therefore, if inexperience prompted teachers to spend more time on conducting routine, teachers with little teaching experience would spend more time than experienced teachers on conducting routine.

In activity (2), Control, age group I had a score of 34 with expected score of 43; group II had a score of 19 with an expected score of 42; age group III had a score of 75 with an expected score of 43. This suggests that Group

TABLE XIV

KRUSKAL-WALLIS ANALYSIS OF VARIANCE TESTS OF DIFFERENCES
BETWEEN ACTIVITY SCORES WHEN TEACHERS
ARE CLASSIFIED BY AGE

Activity Category	Calculated Value of H^a	Degrees of Freedom	Level of Significance
1 ^d	10.0 ^b	2	.01
2	9.0	2	.02
3	7.2	2	.05
4	5.4	2	NS ^c
5	0.3	2	NS
6	6.8	2	NS
7	2.8	2	NS
8	0.1	2	NS
9	5.1	2	NS
10	4.3	2	NS
11	3.1	2	NS
12	2.0	2	NS
13	0.6	2	NS
14	1.1	2	NS
15	0.2	2	NS
16	0.8	2	NS
17	0.6	2	NS
18	3.9	2	NS

^aH: This value of H must be equal to or greater than the critical value of H to be significant at the stated alpha level.

^b10.0: The critical value of H is 8.000 for all variables at the .05 level.

^cNS: Not significant $\alpha = .05$.

^d1: See Table I, page 36, for activity names.

III, the oldest group, spends a greater percentage of time, than the combination of the other two groups, on control. Because teachers, under any of the other classifications, do not differ on the score in this activity, the age of the teacher seems associated to some extent with the percentage of time he spends on control.

Age group I had an observed score of 551, group II had a score of 470, and group III had a score of 380 in activity (3), Presenting information. These age groups had expected scores of 475, 460, and 466 respectively. From these figures, it might be concluded that the age of the teacher is associated with the percentage of time he devotes to activity (3). This conclusion is further supported by finding that teachers under any of the other classifications did not differ on the score in activity (3). Young teachers just out of university are still under the influence of university teaching; therefore, they tend to lecture more than a teacher who has been teaching for two or more years.

Conclusion

Hypothesis 1.1 was partly accepted because teachers classified by age differ significantly at the .05 level of significance on the score in each of three activities; namely, (1) Conducting routine, (2) Control, and (3) Presenting information.

Hypothesis 1.2: Teachers classified on the basis of sex differ significantly in distribution of time on various activities during the school day.

Results

With 17 degrees of freedom, the critical value of chi square needed for significance at the .001 level of significance was 41; the calculated value of chi square was 87. Therefore, the positive hypothesis was not rejected (see Table XV).

The application of a Mann-Whitney test indicated that the teachers in the present sample when classified by sex differed significantly in their scores on only one activity, namely, Clerical writing (10). This difference was significant at the .05 level of confidence (see Table XVI).

Discussion

The observed score in activity (10) was 50 for males and 102 for females. The expected scores were 71 and 81 respectively. This suggests that females rather than males spend a greater percentage of their time on activity (10) Clerical writing. Additional support is given to the discovery by the insignificant differences found in this activity when teachers were classified according to other characteristics. These findings suggest, for this sample, at least, that sex is associated with the proportion of time a teacher devotes to clerical writing. The fact that females spend more time on this activity might be partly explained by Duke's (Supra, p. 19) contention that males are lead to take a more active political role because of social pressures and expectations. Thus, males would tend to de-emphasize

TABLE XV

CHI SQUARE TEST OF THE DIFFERENCE BETWEEN DISTRIBUTIONS OF ACTIVITY
SCORES WHEN TEACHERS ARE CLASSIFIED BY SEX

Activity Category	Observed Frequencies			Expected Frequencies	
	Male	Rank	Female	Rank	Male
1 ^a	42	14	45	15	41
2	43	13	85	11	60
3	650	1	751	1	653
4	620	2	649	2	592
5	168	6	169	5	157
6	18	15	64	12	38
7	186	4	146	6	155
8	55	10	44	16	46
9	8	17	13	17	10
10	50	12	102	8	71
11	15	16	58	13	34
12	125	7	143	7	125
13	62	9	98	10	75
14	77	8	101	9	83
15	177	5	195	4	173
16	51	11	49	14	47
17	2	18	3	18	2
18	205	3	208	3	193
Total					
					2554
					2923

The chi square of 87 with 17 degrees of freedom was significant at the .001 level of confidence.

^a1: See Table I, page 36, for activity names.

TABLE XVI

MANN-WHITNEY U TEST OF DIFFERENCES BETWEEN ACTIVITY
SCORES WHEN TEACHERS ARE CLASSIFIED BY SEX

Activity Category	Calculated Value of U ^a	Critical Value of U	Level of Significance
1 ^c	25.5	13.0	NS ^b
2	19.0	13.0	NS
3	27.5	13.0	NS
4	25.0	13.0	NS
5	24.5	13.0	NS
6	22.0	13.0	NS
7	14.5	13.0	NS
8	15.5	13.0	NS
9	21.0	13.0	NS
10	11.5	12.0	.04
11	27.0	13.0	NS
12	26.5	13.0	NS
13	16.0	13.0	NS
14	21.5	13.0	NS
15	24.5	13.0	NS
16	23.0	13.0	NS
17	25.5	13.0	NS
18	26.0	13.0	NS

^aU: This U must be equal to or less than the critical value of U to be significant at the stated level of significance.

^bNS: Not significant at .05 level of significance.

^c1: See Table I, page 36, for activity names.

activities such as clerical writing.

Conclusions

Hypothesis 1.2 was partly accepted because teachers, classified by sex, differ according to the Mann-Whitney U test at the .05 level of significance on the score in activity (10), Clerical writing.

Hypothesis 1.3: Teachers classified on the basis of marital status differ significantly in distribution of time on various activities during the school day.

Results

The application of a chi square test to the distribution of scores when teachers were classified by marital status produced a calculated chi square of 113 with 17 degrees of freedom. Significance at the .001 level required a chi square of 41; therefore, the hypothesis was not rejected (see Table XVII).

The Mann-Whitney test on individual activities which was used following the significant chi square test revealed no significant differences between the score in any one of the activities. That is, there were no probabilities of .05 associated with any of the calculated U's (see Table XVIII).

Discussion

While it seems that a significant difference between distributions would imply the existence of differences between scores in individual activities, the Mann-Whitney

TABLE XVII

CHI SQUARE TEST OF THE DIFFERENCE BETWEEN DISTRIBUTIONS OF ACTIVITY
SCORES WHEN TEACHERS ARE CLASSIFIED BY MARITAL STATUS

Activity Category	Observed Frequencies			Expected Frequencies	
	Single	Rank	Married	Single	Married
1 ^a	24	15	63	29	58
2	36	13	92	42	86
3	477	2	924	464	937
4	481	1	788	420	849
5	99	5	238	111	226
6	45	10	37	27	55
7	116	4	216	110	222
8	37	12	62	33	66
9	6	17	15	7	14
10	39	11	113	50	102
11	17	16	56	24	49
12	83	6	185	89	179
13	71	7	89	53	107
14	56	9	122	59	119
15	130	3	242	123	249
16	29	14	71	33	67
17	1	18	4	2	3
18	65	8	348	137	276
TOTAL				1812	3665

The chi square of 113 with 17 degrees of freedom was significant at the .001 level of confidence.

^a1: See Table I, page 36, for activity names.

TABLE XVIII

MANN-WHITNEY U TEST OF DIFFERENCES BETWEEN ACTIVITY SCORES
WHEN TEACHERS ARE CLASSIFIED BY MARITAL STATUS

Activity Category	Calculated Value of U ^a	Critical Value of U	Level of Significance
1 ^c	17.0	8.0	NS ^b
2	20.5	8.0	NS
3	23.0	8.0	NS
4	14.5	8.0	NS
5	18.5	8.0	NS
6	18.5	8.0	NS
7	21.0	8.0	NS
8	23.5	8.0	NS
9	20.5	8.0	NS
10	18.5	8.0	NS
11	21.5	8.0	NS
12	21.5	8.0	NS
13	9.0	8.0	NS
14	25.0	8.0	NS
15	22.5	8.0	NS
16	18.5	8.0	NS
17	20.0	8.0	NS
18	13.0	8.0	NS

^aU: This U must be equal to or less than the critical value of U to be significant at the stated alpha level.

^bNS: Not significant at .05 level of significance.

^c1: See Table I, page 36, for activity names.

test did not indicate any significant differences. This is possible because the general distribution of scores may differ due to inconsistent inequality of scores. One distribution may contain scores which are larger in alternate activities from those scores in the other distribution. Or, one distribution may be weighted at the top end while the other is weighted at the lower end; thus, even though there is a difference in the distribution, there may not be any significant difference between scores in individual activities.

The fact that only five of the fifteen teachers were not married (Supra, page 56) may have accounted for some of the reason that no significant differences between scores were found.

Conclusions

The positive hypothesis was rejected because no significant differences were found between scores in individual activities. It was concluded that teachers classified by marital status do not differ significantly on the score in each activity.

II. A COMPARISON OF TEACHER ACTIVITIES WHEN TEACHERS ARE CLASSIFIED BY FIELD OF SPECIALIZATION, YEARS OF EDUCATION, AND YEARS OF TEACHING EXPERIENCE

Hypotheses 2.1, 2.2, and 2.3 are considered in this section. The purpose of these hypotheses was to determine whether the professional characteristics of teachers are

associated with the percentage of time they spend on selected activities. Does the proportion of time a teacher devotes to controlling the class or to presenting information bear any relationship to the amount of teaching experience he has? Is there a difference in the proportion of time spent on certain activities by teachers with four years of education compared to the proportion of time spent by teachers with four or more years of university education?

Hypothesis 2.1: Teachers classified on the basis of field of specialization differ significantly in distribution of time on various activities during the school day.

Results

The hypothesis was not rejected on the findings of the first test because with 34 degrees of freedom a probability of .001 was associated with a chi square value of 73 as compared to the produced chi square value of 254. This indicated that the distributions of scores, for teachers grouped on the basis of specialization, differed significantly. The significant chi square value justified application of the test for individual activities (see Table XIX).

Since field of specialization consisted of three groups, a Kruskal-Wallis test was used to determine if the scores of the three groups of teachers differed significantly. While the chi square test revealed differences in distributions between fields of specialization, the Kruskal-Wallis test yielded no significant H value for any of the

TABLE XIX

CHI SQUARE TEST OF THE DIFFERENCE BETWEEN DISTRIBUTIONS OF ACTIVITY SCORES
WHEN TEACHERS ARE CLASSIFIED BY FIELD OF SPECIALIZATION

Activity Category	Observed Frequencies				Expected Frequencies			
	Lang Arts	Rank	Social S.	Rank	Math-Sci	Rank	Lang Arts	Math-Sci
1 ^a	46	13	32	14	9	14	41	35
2	44	14	67	8	17	11	60	51
3	691	1	507	2	203	1	654	561
4	570	2	515	1	184	2	592	508
5	155	5	135	5	47	5	157	135
6	16	16	64	10	2	17	38	33
7	194	3	88	7	50	4	155	133
8	61	11	28	15	10	13	46	40
9	6	7	10	17	5	15	10	8
10	70	10	59	11	23	9	71	61
11	56	12	14	16	3	16	34	29
12	147	6	95	6	26	6	125	107
13	84	9	57	12	19	10	75	64
14	87	8	66	9	25	7	83	71
15	160	4	148	4	64	3	174	149
16	43	15	41	13	16	12	47	40
17	2	18	2	18	1	18	2	2
18	125	7	264	3	24	8	193	165
TOTAL							2557	2191
								728

The chi square of 254 with 34 degrees of freedom was significant at the .001 level of confidence.

^a1: See Table I, page 36, for activity names.

eighteen activities (see Table XX).

Discussion

The lack of significant differences between scores in individual activities may be attributable to the unequal number of teachers in the three groups when classified by field of specialization (Supra, p. 58). Because the one group had only two teachers, representation was not sufficient. Another reason for no significant differences may have been the looseness in grouping the various fields of specialization into three broad groups. For example, the fields of specialization in the Language Arts group were quite diverse. Different groupings may have produced different results.

The seemingly contrary findings produced by the chi square and Kruskal-Wallis tests is possible because chi square is considering the overall distribution of scores while the Kruskal-Wallis test considers the distribution of scores within an individual activity.

Conclusions

Hypothesis 2.1 was not accepted; the hypothesis which states that teachers classified by field of specialization differ on the activity score in the selected activities was not accepted

Hypothesis 2.2: Teachers classified on the basis of years of education differ significantly in distribution of time on various activities during the school day.

TABLE XX

KRUSKAL-WALLIS ANALYSIS OF VARIANCE TEST OF DIFFERENCES
BETWEEN ACTIVITY SCORES WHEN TEACHERS ARE CLASSIFIED
BY FIELD OF SPECIALIZATION

Activity Category	Calculated Value of H^a	Degrees of Freedom	Level of Significance
1 ^d	1.6 ^b	2	NS ^c
2	.6	2	NS
3	1.3	2	NS
4	1.2	2	NS
5	.6	2	NS
6	.1	2	NS
7	3.2	2	NS
8	5.1	2	NS
9	1.9	2	NS
10	1.4	2	NS
11	.4	2	NS
12	1.5	2	NS
13	1.1	2	NS
14	.2	2	NS
15	2.5	2	NS
16	.3	2	NS
17	.3	2	NS
18	4.4	2	NS

^aH: This value of H must be equal to or greater than the critical value of H to be significant at the stated alpha level.

^b1.6: The critical value of H is 5.99 for all variables.

^cNS: Not significant $\alpha = .05$.

^d1: See Table I, page 36, for activity names.

Results

The distributions of activity scores for teachers classified on the basis of years of education were shown to be significantly different. The chi square calculated was 213 with 34 degrees of freedom. The critical value of chi square was 73 at the .001 level of significance (see Table XXI). Thus, the hypothesis was not rejected and the data were submitted to the second order analysis on individual activities. The second analysis determines whether significant differences exist between scores in individual activities.

The application of Kruskal-Wallis tests to the activity scores in each activity indicated that there were no differences between the scores in each activity when teachers were classified by years of university education. No calculated H was associated with a probability of .05 (see Table XXII).

Discussion

As explained in the preceding discussion under hypothesis 2.1, it is possible to have significant differences between the distributions of scores and not have significant differences between the scores in an individual activity. The smallness of groups two and three under the classification "years of education" may have accounted for some of the lack of significant differences between scores (Supra, p. 59).

TABLE XXI

CHI SQUARE TEST OF THE DIFFERENCE BETWEEN DISTRIBUTIONS OF ACTIVITY SCORES
WHEN TEACHERS ARE CLASSIFIED BY YEARS OF EDUCATION

Activity Category	Observed Frequencies			Expected Frequencies		
	0-3	Rank	4	Rank	5	Rank
1 ^a	29	14	28	15	30	15
2	39	10	56	11	33	13
3	413	1	610	1	378	2
4	256	2	538	2	475	1
5	107	4	113	5	117	4
6	33	12	45	12	4	17
7	81	7	139	4	112	6
8	30	13	31	14	38	12
9	2	17	8	17	11	16
10	50	8	59	10	43	11
11	5	16	20	16	48	9
12	88	6	86	7	94	7
13	39	10	74	8	47	10
14	49	9	71	9	58	8
15	96	5	162	3	114	5
16	24	15	43	13	33	13
17	2	17	2	18	1	18
18	130	3	94	6	189	3
TOTAL						
					1473	2179
						1825

The chi square of 213 with 34 degrees of freedom was significant at the .001 level of confidence.

^a1: See Table I, page 36, for activity names.

TEST XXII

KRUSKAL-WALLIS ANALYSIS OF VARIANCE TEST OF DIFFERENCES
BETWEEN ACTIVITY SCORES WHEN TEACHERS ARE CLASSIFIED
BY YEARS OF UNIVERSITY EDUCATION

Activity Category	Calculated Value of H^a	Degrees of Freedom	Level of Significance
1 ^d	2.9 ^b	2	NS ^c
2	1.2	2	NS
3	4.1	2	NS
4	5.3	2	NS
5	3.5	2	NS
6	.1	2	NS
7	.1	2	NS
8	5.5	2	NS
9	1.4	2	NS
10	.6	2	NS
11	1.1	2	NS
12	2.0	2	NS
13	1.3	2	NS
14	.2	2	NS
15	1.0	2	NS
16	.1	2	NS
17	.8	2	NS
18	2.5	2	NS

^aH: This value of H must be equal to or greater than the critical value of H to be significant at the stated alpha level

^b2.9: The critical value of H is 5.99 for all variables.

^cNS: Not significant $\alpha = .05$.

^d1: See Table I, page 36, for activity names.

Conclusions

Hypothesis 2.2 was rejected on the basis of the Kruskal-Wallis test, because there was no significant difference between the teacher activity scores in any of the activities. The null hypothesis was accepted: teachers classified by years of university education do not differ on the score in each of the activities selected for this study.

Hypothesis 2.3: Teachers classified on the basis of years of teaching experience differ significantly in distribution of time on various activities during the school day.

Results

The critical value of chi square for significance at the .001 level and 34 degrees of freedom is 73. The test of the difference between distributions of activity scores for teachers classified by years of experience revealed a chi square of 258 (see Table XXIII). On the basis of the chi square test, the distributions of scores were significantly different. Thus, the hypothesis was not rejected.

The Kruskal-Wallis test disclosed an H value of 8.3 with 2 degrees of freedom in activity (9) Creative writing. This was significant at the .02 level of probability (see Table XXIV).

Discussion

The score in activity (9) for teachers with 1 and 2 years of teaching experience was 4; the score for teachers with 3 through 5 years of teaching experience was 1; for teachers with 6 or more years of teaching experience the

CHI SQUARE TEST OF THE DIFFERENCE BETWEEN DISTRIBUTIONS OF ACTIVITY SCORES WHEN TEACHERS ARE CLASSIFIED BY YEARS OF TEACHING EXPERIENCE

The chi square of 258 with 34 degrees of freedom was significant at the .001 level of confidence.

^a1: See Table I, page 36, for activity names.

TABLE XXIV

KRUSKAL-WALLIS ANALYSIS OF VARIANCE TEST OF DIFFERENCES
BETWEEN ACTIVITY SCORES WHEN TEACHERS ARE CLASSIFIED
BY YEARS OF TEACHING EXPERIENCE

Activity Category	Calculated Value of H^a	Degrees of Freedom	Level of Significance
1 ^d	3.9 ^b	2	NS ^c
2	4.2	2	NS
3	3.7	2	NS
4	1.2	2	NS
5	.5	2	NS
6	2.1	2	NS
7	2.9	2	NS
8	.8	2	NS
9	8.3	2	.02
10	3.9	2	NS
11	.2	2	NS
12	1.0	2	NS
13	.2	2	NS
14	.6	2	NS
15	.3	2	NS
16	.5	2	NS
17	2.7	2	NS
18	.9	2	NS

^aH: This value of H must be equal to or greater than the critical value of H to be significant at the stated alpha level.

^b3.9: The critical value of H is 7.82 for all variables.

^cNS: Not significant $\alpha = .05$.

^d1: See Table I, page 36, for activity names.

score was 16. The expected score for each group was 8, 6, and 7. A comparison of the actual scores and the expected scores indicate that teachers with 6 or more years of experience spend a greater percentage of time than teachers with less experience on creative writing. This conclusion was supported because no significant differences between activity scores were found under the other classifications.

The finding that teachers differ as to the percentage of time they spend on creative writing indirectly supports theory which claims that experience is associated with individual behavior. On this point Tolman (Supra, p. 19) contends that because of past experience a person brings a belief-value framework to any new stimulus.

Conclusions

Hypothesis 2.3 was partly accepted because teachers classified by years of teaching experience were found to differ at the .05 level of significance on the activity score in activity (9) Creative writing.

III. A COMPARISON OF TEACHER ACTIVITIES WHEN TEACHERS ARE CLASSIFIED BY CONVENTIONAL SCHOOL, AND TEAM TEACHING SCHOOL

The hypothesis tested in this section was concerned with the association between the type of school in which a teacher teaches and the way he spends his time. Do teachers in each school distribute their time in similar or different patterns? On which particular activities do they differ?

Does the type of school organization bear any relationship to the time allotted by teachers to certain activities?

Hypothesis 3 : Teachers classified on the basis of type of school differ significantly in distribution of time on various activities during the school day.

Results

Significant differences were found at the .001 level for the distribution over all activities when teachers were classified by type of school (see Table XXV). Although the positive hypothesis on the basis of this evidence was not rejected, it was not accepted pending results from the application of the Mann-Whitney test. This test revealed that teachers classified on the basis of type of school differed significantly, at the .01 level of significance for the two-tailed test, in the activity score in activities (1) Conducting routine, and (6) Observing, and at the .02 level of significance in activities (14) Transition (teacher), and (18) Unable to observe. At the .05 level of significance, activity (7), Interacting with adults, revealed a significant difference between the two, team-teaching and conventional, school scores of teachers. Table XXVI reports significant and non-significant differences for individual activities, based on the Mann-Whitney U test.

Discussion

Activity (3), Presenting information, ranked first in each of the schools. A greater percentage of time was spent by teachers on this activity than on any other single acti-

TABLE XXV

CHI SQUARE TEST OF THE DIFFERENCE BETWEEN DISTRIBUTIONS OF ACTIVITY SCORES
WHEN TEACHERS ARE CLASSIFIED BY TYPE OF SCHOOL

Activity Category	Observed Frequencies		Rank	Team-teaching		Rank	Expected Frequencies	
	Conventional	Rank		Team-teaching	Rank		Conventional	Team-teaching
1 ^a	68	12		19		16	53	34
2	90	10		38		14	78	50
3	859	1		542		1	853	548
4	747	2		522		2	773	496
5	220	5		117		5	205	132
6	2	18		80		8	50	32
7	156	7		176		3	202	130
8	52	14		47		13	60	39
9	12	16		9		17	13	8
10	102	8		50		12	93	59
11	13	15		60		11	44	29
12	178	6		90		7	163	105
13	97	9		63		10	97	63
14	84	11		94		6	108	70
15	242	4		130		4	227	145
16	63	13		37		15	61	39
17	4	17		1		18	3	2
18	346	3		67		9	251	162
TOTAL							3335	2142

The chi square of 340 with 17 degrees of freedom was significant at the .001 level of confidence.

^a1: See Table I, page 36, for activity names.

TABLE XXVI

MANN-WHITNEY U TEST OF DIFFERENCE BETWEEN ACTIVITY SCORES
WHEN TEACHERS ARE CLASSIFIED BY TYPE OF SCHOOL

Activity Category	Calculated Value of U ^a	Critical Value of U	Level of Significance
1 ^c	0.0	2.0	.01
2	19.5	10.0	NS ^b
3	24.5	10.0	NS
4	26.5	10.0	NS
5	18.5	10.0	NS
6	1.0	2.0	.01
7	8.0	10.0	.05
8	19.0	10.0	NS
9	25.0	10.0	NS
10	21.5	10.0	NS
11	16.5	10.0	NS
12	18.0	10.0	NS
13	25.5	10.0	NS
14	5.0	7.0	.02
15	14.0	10.0	NS
16	20.5	10.0	NS
17	19.5	10.0	NS
18	7.0	7.0	.02

^aU: This U must be equal to or less than the critical value of U to be significant at the stated alpha level.

^bNS: Not significant at .05 level of significance.

^c1: See Table I, page 36, for activity names.

vity. This might indicate that both groups of teachers regard this activity as the most important one. Again, both schools ranked activity (4) Instructional supervision second. While theory according to Trump (Supra, p. 21) and Hillson (Supra, p. 22) intimate that team teachers would rank different from teachers in a conventional school on these two activities, the findings of this study do not support these intimations. In both schools activity (15), Travel, ranked fourth. A comparison of the two school structures and organization (Supra, p. 62) would lead to the conclusion that team teachers should rank this activity lower than the other group of teachers would. This prompts the question, does the structure have any relationship to the percentage of time spent by teachers on travel?

Shaplin (Supra, p. 23) seems to suggest that team teachers, because of the increasing responsibility of managerial functions, would need a greater percentage of time than teachers in a conventional school to take care of these responsibilities. Theoretically, team teachers should rank activity (7) Interacting with adults higher than teachers in a conventional school would. The findings of this study revealed that team teachers ranked activity (7) third and the other group of teachers ranked it seventh.

The activity score, for conventional teachers, in activity (1) (Conducting routine) was 68, the expected score was 53.0; for team teachers the scores were 19 and 34.0. This suggests that conventional teachers spend a greater

percentage of time than team teachers on conducting routine. Much of this difference might be attributed to the practice of the principal in the team-teaching school. During the first five minutes of the morning the principal conducted the morning exercises and made announcements; this reduced the time spent, by teachers, on this activity.

On activity (6), Observing, teachers in the conventional school scored 2, the expected score was 50, and team teachers scored 80, the expected was 32. This indicates that team teachers, more than conventional teachers, devote a greater percentage of time to observing other teachers who are teaching. Since no significant differences appear on the basis of other classifications, and no unusual practices by the principal or the teachers were evident, the type of school is, on the basis of these analyses, associated, for this sample, with the activity score in activity (6), Observing. Because teachers who are working in a team, whether the team is two or more, have time to observe the lecturing or presenting teacher, the percentage of time devoted by team teachers to this activity is greater than the percentage of time devoted, by conventional teachers, to this same activity.

Teachers in the conventional school had an activity score of 156 in activity (7) whereas the expected score by chi square calculations was 202. Team teachers had an observed score of 176 and an expected score of 130 in activity (7), Interacting with adults. From these values,

it appears that team teachers spend a greater percentage of time than teachers in the conventional school on this activity. This finding supports theory as propounded by Shaplin (Supra, p. 23).

In activity (14), Transition (teacher), scores were 94 observed and 70 expected for team teachers. Under no other classifications used in this study were significant differences between scores on activity (14) discovered. Although teachers in the conventional school moved from room to room during class period changes, they did not move, partly because of the physical size of the room, as much as team teachers. In the team-teaching school, the convenience of the library encouraged its use, thereby promoting movement by team teachers from their teaching area to it. The proximity of the audio-visual storeroom may have had the same influence. The general ease of movement and the visibility of all areas from any one point within the team teaching area was conducive to teacher transition.

Category (18), Unable to observe, was not an activity in the same sense as activities (1) through (16); rather, it was a category included to take account, during the round, of a teacher who was absent or unobservable. Expected scores were 251 for teachers in the conventional school and 162 for team teachers. Observed scores were 346 and 67 for teachers in the conventional school and team teachers respectively. The larger scores of teachers in the conventional school are attributable to the absence of these

teachers. Many of the absences of these teachers were due to the training periods which were in progress during the last week of the observations. During the morning and afternoon of the last week, there were at least two to three teachers attending the training sessions which were held at other schools. These sessions were preparatory meetings aimed at orienting the teachers for team teaching which was to be initiated in the school next year. The total teachers in the conventional school were unobservable, for reasons other than attendance at the meetings, about three or four times.

Conclusions

Because teachers classified by the type of school in which they teach differ at the .05 level of significance or higher in seven activities, for example, (1) Conducting routine, (6) Observing, (7) Interacting with adults, (14) Transition (teacher), and (18) Unable to observe, Hypothesis 3 was partly accepted.

IV. A COMPARISON OF TEACHER ACTIVITY SCORES WHEN SCORES ARE CLASSIFIED BY THE TIME UNIT OF THE DAY

Hypothesis 4, which was formulated to guide an analysis of the association between the time of the day and the percentage of time spent by teachers, is discussed in this section. Do teachers allot more time in the first hour of the day to certain activities than they allot in the third hour of the day to the same activities? Which

activities receive more time in the last time unit of the day? Are some activities emphasized more than others throughout the day?

Hypothesis 4 : Teacher activity patterns differ for various time units of the day.

Results

The application of a chi square test to the distributions of scores under this classification revealed a chi square value of 336 with 68 degrees of freedom. A probability of .001 was associated with a chi square value of 112; thereby, the differences between distributions was deemed significant (see Table XXVII).

Table XXVIII reveals that critical values of H at the .05 level of significance were found when scores within each of the following activities were compared and tested by the Kruskal-Wallis test: (1) Conducting routine, (4) Instructional supervision, (7) Interacting with adults, (15) Transition (teacher), (16) Personal, and (17) No interpretable activity. A critical value of H means that significant differences exist between the scores.

Discussion

Reference to Table XXVII discloses that a greater percentage of time is devoted during time units 1 and 4 to activity (1) Conducting routine. Since time unit 1 includes morning exercises and time unit 4 begins the afternoon of the school day, some of the difference between the percentage

TABLE XXVII

CHI SQUARE TEST OF THE DIFFERENCE BETWEEN DISTRIBUTIONS OF ACTIVITY SCORES
WHEN SCORES ARE CLASSIFIED BY TIME UNIT OF THE DAY

Activity Category	Observed Frequencies					Expected Frequencies				
	9-10 Rank	10-11 Rank	11-12 Rank	1-30-2:45 Rank	2:45-4 Rank	9-10	10-11	11-12	1:30-2:45	2:45-4
1 ^a	25	10	15	14	26	12	15	14	16	21
2	22	11	12	11	28	11	34	9	23	30
3	303	1	1	2	307	2	304	1	255	332
4	221	2	166	1	308	1	271	2	231	301
5	50	6	59	4	98	3	61	5	61	80
6	14	14	14	12	24	14	5	16	15	19
7	54	5	104	3	57	7	94	4	60	79
8	18	13	13	10	24	14	14	15	18	23
9	6	16	17	17	10	17	3	17	4	5
10	29	8	35	9	32	10	27	11	28	36
11	12	15	16	16	25	13	25	13	13	17
12	49	7	54	8	77	6	55	7	49	63
13	22	11	32	6	37	9	32	10	29	38
14	27	9	32	5	40	8	38	3	32	42
15	63	4	69	7	98	3	108	1	68	88
16	4	17	43	15	18	16	26	12	18	23
17	0	18	17	0	4	18	0	18	1	1
18	78	3	101	3	84	5	58	6	75	98
TOTAL							997	986	1027	1297
										1170

The chi square of 336 with 68 degrees of freedom was significant at the .001 level of confidence.

^a1: See Table I, page 36, for activity names.

TABLE XXVIII

KRUSKAL-WALLIS ANALYSIS OF VARIANCE TEST OF DIFFERENCES
BETWEEN INDIVIDUAL ACTIVITY SCORES WHEN SCORES ARE
CLASSIFIED BY TIME UNIT OF THE DAY

Activity Category	Calculated Value of H ^a	Degrees of Freedom	Level of Significance
1 ^d	10.0 ^b	4	.05
2	1.6	4	NS ^c
3	7.3	4	NS
4	19.0	4	.05
5	6.0	4	NS
6	1.0	4	NS
7	22.9	4	.05
8	6.5	4	NS
9	7.9	4	NS
10	2.1	4	NS
11	3.5	4	NS
12	3.6	4	NS
13	3.7	4	NS
14	1.6	4	NS
15	18.1	4	.05
16	25.4	4	.05
17	12.7	4	.05
18	.7	4	NS

^aH: This value of H must be equal to or greater than the critical value of H to be significant at the stated alpha level.

^b10.0: The critical value of H is 9.49 for all variables.

^cNS: Not significant $\alpha = .05$.

^d1: See Table I, page 36, for activity names.

of time spent on activity (1) during these times compared to the percentage of time spent during other times on the same activity might be attributable to the opening exercises and routine settling down that is typical of these times of the day. This difference is further explained by the significant differences found between scores when teachers were classified according to type of school, and to the age of the teacher.

In considering activity (4) Instructional supervision, scores suggest that a smaller percentage of time is allotted during unit 2 to activity (4) than is allotted during the other units to this activity. A recess of fifteen minutes which was given during unit 2 may account for small activity scores. By comparing the observed scores with the expected scores, it is evident that the proportion of time spent on activity (4) was greater during unit 3 than during the other units. Whereas no significant differences between scores in this activity were revealed under other classifications, it seems that the percentage of time used during unit 3 is not associated with the other variables. The percentage of time spent on activity (4) in unit 3 might be explained by the possibility that teachers are becoming fatigued about this time of the day, so more time is devoted to instructional supervision. The kinds of subjects scheduled for time unit 3 may account for the percentage of time spent, but, since various subjects were being taught during this time unit, it seems that no one kind of subject can be held responsible

for the percentage of time spent.

To activity (7), Interacting with adults, a greater percentage of time was given during units 2 and 5, than was given during the other time units. During units 1, 3, and 4, the actual activity scores in this activity were close to the expected scores. The reason that each score in units 2 and 5 is larger than the expected score in each unit might be that, because a recess was given in both schools during each of these time units, the teachers had more opportunity to interact with adults. Some of the difference might be attributable to the type of school because significant differences between scores under classification by school were found.

While actual scores and expected scores for units 1, 2, and 4, in activity (15), Travel, were about the same, the actual score in unit 3 was much less than the expected score. The actual score in unit 5 was much larger than the expected score. Because no significant differences were found between scores in other classifications, the low score in unit 3 is probably associated with the fact that time unit 3 was not interrupted by class or room changes. The difference between the actual and expected scores in unit 5 might be explained by the presence of a recess and a room change in that unit.

In activity (16), Personal, the actual score and expected score were about the same in each of the time units 4 and 5. Time unit 1 had an actual score much smaller than the expected; time unit 2 had an actual score much greater

than the expected; and time unit 3 had a score much smaller than the expected. This low-high-low pattern of time associated with personal activities, while not found under the other classifications, might be accounted for by the recess during time unit 2 although this reasoning is not supported by the relationship between scores and the recess given during unit 5.

The relatively high score (actual 4.0, expected 1.0) in activity (17), No interpretable activity, for time unit 4 might be related to the fact that all scores in this activity were extremely small compared to the scores in other activities. Thus, although statistical differences were found, the actual differences in terms of frequency counts were so small that any attempt to account for them would probably be of questionable value.

V. A COMPARISON OF TEACHER ACTIVITY SCORES TO DETERMINE THE ASSOCIATION BETWEEN VARIABLES AND THE PERCENTAGE OF TIME SPENT ON ACTIVITIES

The purpose of this section was to determine whether certain variables are independent of other variables. A chi square test was applied to the activity scores classified on the basis of two variables. Whenever a significant difference was found between scores by application of a Mann-Whitney U or Kruskal-Wallis test in an activity under more than one classification, a chi square test was applied to a contingency table based on the two variables.

Table XXIX, which presents a summary of the statistical tests performed so far in this thesis, reveals that significant differences were found between scores on activity (1), Conducting routine, when teacher activity scores were classified by type of school, age, and time unit of the day. Consequently, a contingency table was constructed so the chi square test could be used to determine whether the association between the type of school and the teacher activity score was independent of the association between teacher age and the teacher activity score (see Table XXX). By use of a contingency table, a chi square test was used to determine whether type of school was independent of time unit of the day (see Table XXXI). Another chi square test was applied to discover if age was independent of time unit of the day (see Table XXXII).

In activity 7 (Interacting with adults), previous testing indicated a significant difference between scores was found under the classification of scores by type of school, and time unit of the day. A chi square test was used to determine if type of school and time unit of the day were independent of each other (see Table XXXIII).

Results and Discussion

The chi square of 31.57 which was associated with a probability of .001 indicated that teachers differed significantly on the score in activity 1 (Conducting routine) when teachers were classified by type of school and age (see

TABLE XXIX

TESTS OF DIFFERENCES BETWEEN DISTRIBUTIONS OF SCORES AND
BETWEEN SCORES IN INDIVIDUAL ACTIVITIES

Hypothesis	Chi square test of difference between distributions of scores	Mann-Whitney U test of difference between scores in each activity	Kruskal-Wallis test of difference between scores in each activity
1.1 Age	Significant $\alpha = .001$		(1) $\alpha = .01$ (2) $\alpha = .01$ (3) $\alpha = .05$
1.2 Sex	Significant $\alpha = .001$	(10) $\alpha = .04$	
1.3 Marital	Significant $\alpha = .001$	None	
2.1 Field of Speciali- zation	Significant $\alpha = .001$		None
2.2 Years of Education	Significant $\alpha = .001$		None
2.3 Years of Experience	Significant $\alpha = .001$		(9) $\alpha = .02$
3 Type of School	Significant $\alpha = .001$	(1) $\alpha = .01$ (6) $\alpha = .01$ (7) $\alpha = .05$ (14) $\alpha = .02$ (18) $\alpha = .02$	
4 Time Unit	Significant $\alpha = .001$		(1) $\alpha = .05$ (4) $\alpha = .05$ (7) $\alpha = .05$ (15) $\alpha = .05$ (16) $\alpha = .05$ (17) $\alpha = .05$

TABLE XXX

CONTINGENCY TABLE OF ACTIVITY SCORES IN ACTIVITY 1
CLASSIFIED BY TYPE OF SCHOOL AND AGE

		Type of School		
		Conventional	Team Teaching	Total
Age	1. 18-24 yrs.	43	0	43
	2. 25-26 yrs.	7	12	19
	3. 27 or more yrs.	18	7	25
	Total	68	19	87

Chi square = 31.57 Degrees of freedom = 2

Required chi square = 13.82 at the .001 alpha level

TABLE XXXI

CONTINGENCY TABLE OF ACTIVITY SCORES IN ACTIVITY 1
CLASSIFIED BY TYPE OF SCHOOL AND
TIME UNIT OF THE DAY

		Type of School		
		Conventional	Team Teaching	Total
Time Unit of the Day	1. 9-10 a.m.	19	2	21
	2. 10-11 a.m.	3	3	6
	3. 11-12 a.m.	9	3	12
	4. 1:30-2:45 p.m.	20	7	27
	5. 2:45-4p.m.	9	4	13
	Total	60	19	79

Chi square = 5.02 Degrees of freedom = 4

Required chi square = 9.49 at the .05 alpha level

TABLE XXXII

CONTINGENCY TABLE OF ACTIVITY SCORES IN ACTIVITY 1
CLASSIFIED BY AGE AND TIME UNIT OF THE DAY

		Group 1 18-24yrs	Group 2 25-26yrs	Group 3 27 or more	TOTAL
Time Unit of the Day	1. 9-10 a.m.	13	4	8	25
	2. 10-11 a.m.	4	3	2	9
	3. 11-12 a.m.	5	3	4	12
	4. 1:30-2:45 p.m.	13	4	9	26
	5. 2:45-4 p.m.	8	5	2	15
	Total	43	19	25	87

Chi square = 26.62 Degrees of freedom = 4

Required chi square = 18.46 at the .001 alpha level

TABLE XXXIII

CONTINGENCY TABLE OF ACTIVITY SCORES IN ACTIVITY 7
CLASSIFIED BY TYPE OF SCHOOL AND
TIME UNIT OF THE DAY

		Type of School		
		Conventional	Team Teaching	Total
Time Unit of the Day	1. 9-10 a.m.	28	26	54
	2. 10-11 a.m.	65	39	104
	3. 11-12 a.m.	5	18	23
	4. 1:30-2:45 p.m.	29	28	57
	5. 2:45-4 p.m.	29	65	94
	Total	156	176	332

Chi square = 4.53 Degrees of freedom = 8

Required chi square = 15.51 at the .05 level

Table XXX). Therefore, type of school is not independent of age as reflected in activity scores. In other words, there is a difference between the proportion of time spent in the conventional school by teachers in age groups 1,2, and 3. Much of the difference between the scores in the various arrangements may be accounted for by the policy of the principal in the team teaching school whereby he took much of the responsibility for conducting routine.

There is no significant difference at the .05 alpha level between activity scores when teacher scores were classified by type of school and time unit of the day (see Table XXXI). That is, the proportion of time spent by teachers in the conventional school during the time units of the day does not differ from the proportion of time spent by team teaching teachers during the five time units of the day. The variables are not dependent on each other.

In activity 1, when scores were classified by age and time unit of the day (see Table XXXII), a chi square of 26.62 which was significant at the .001 alpha level was found. This suggested that the percentage of time spent during each time unit of the day by teachers in an age group differed significantly from the percentage of time spent during each time unit of the day by teachers in another age group. Thus, age and time unit of the day were dependent on each other.

In activity 7, the chi square of 4.53 was not significant at the .05 alpha level; therefore, the variables were independent of each other. The results of all four tests

are summarized in Table XXXIV.

Conclusion

The type of school in which the teacher teaches and the age of the teacher are associated with a probability of .001 when consideration is given to the proportion of time they spend in activity 1 (conducting routine).

The age of the teacher and the time unit of the day are associated with a probability of .001 when the percentage of time devoted by teachers of activity 1 (conducting routine) is considered.

VI. SUMMARY

In this chapter eight hypotheses were tested to determine which variables were significantly associated with the percentage of time utilized by teachers on certain tasks. In other words an attempt was made to determine which factors (type of school, personal and professional characteristics, time of day) are significantly associated with the priority, in terms of time, given to eighteen pre-determined categories of teacher tasks.

It was discovered that teachers grouped on the basis of any one of the classifications differed significantly on the distribution of scores over all the activities. In addition, secondary tests on individual activities revealed the following:

Hypothesis 1.1: Teachers classified by age differ

TABLE XXXIV

CHI SQUARE TEST OF DIFFERENCE BETWEEN SCORES IN ACTIVITIES
WHEN SCORES ARE CLASSIFIED BY TWO VARIABLES

Activity	Variable	Calculated value ^a of chi square	Critical value ^b of chi square	Level of significance
1	Type of school Age	31.57	13.82	.001
1	Type of school Time unit of day	5.02	9.49	NS ^c
1	Age Time unit of day	26.62	18.46	.001
7	Type of school Time unit of day	4.53	15.51	NS

^aCalculated value: To be significant, at the stated alpha level, this value must be equal to or greater than the critical value of chi square.

^bCritical value: These values were taken from Table C, Ferguson (1, p. 407).

^cNS: Not significant at the .05 level of significance.

significantly on the importance, in terms of time, placed on activities 1 (Conducting routine), 2 (Control), and 3 (Presenting information).

Hypothesis 1.2: Teachers classified by sex differ significantly on the score in activity 10 (Clerical writing).

Hypothesis 1.3: Teachers classified by marital status did not differ significantly on the percentage of time allotted to any activity.

Hypothesis 2.1: Teachers classified by field of specialization did not differ significantly on the score in any of the individual activities.

Hypothesis 2.2: Teachers classified by years of education did not differ significantly on the percentage of time devoted to each activity.

Hypothesis 2.3: Teachers classified by years of experience differ significantly on the priority, in terms of time, given to activity 9 (Creative writing).

Hypothesis 3: Teachers classified by type of school differ significantly on the emphasis, in terms of time, on activities named: 1 (Conducting routine), 6 (Observing), 7 (Interacting with adults), 14 (Transition--teacher), and 18 (Unable to observe).

Hypothesis 4: When activity scores are classified by the time unit of the day, teachers differ significantly on the percentage of time devoted to activities named: 1 (Conducting routine), 4 (Instructional supervision), 7 (Interacting with adults), 15 (Travel), 16 (Personal), and 17 (No

interpretable activity).

In activity 1 (Conducting routine) when teachers were grouped on the basis of type of school and age, teachers differed significantly on the activity score. Thus, type of school and age are not independent of each other. Much of the difference between activity scores may be attributable to the policy whereby the principal in the team teaching school took much of the responsibility for conducting routine.

In activity 1 (Conducting routine) when teachers were grouped on the basis of age and time unit of the day teachers differed significantly on the activity score. Therefore, age and time unit of the day were found to be not independent of each other.

REFERENCES FOR CHAPTER V

1. Ferguson, George A. Statistical Analysis in Psychology and Education. Toronto: McGraw-Hill Book Company, 1966.
2. Hays, William L. Statistics for Psychologists. Toronto: Holt, Rinehart and Winston, 1963.
3. Seigel, Sidney. Nonparametric Statistics for the Behavioral Sciences. Toronto: Mc-Graw-Hill Book Company, Inc., 1956.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

The first section summarizes the problem, hypotheses, instrumentation and methodology, sample, and results of this study. Section two presents conclusions and implications.

I. SUMMARY

The Problem

The objective of the study was to determine whether there is a relationship between the structure and organization of a school and the utilization of instructional staff within the school. More specifically the objective was to determine whether teachers in a conventional school and team teaching school differ in the proportion of time they spend on various tasks.

Hypotheses

In order to facilitate research and investigation of the problem, hypotheses were constructed in positive form. The hypotheses are states as follows:

1. Teachers classified on the basis of personal characteristics differ significantly in distribution of time on each of the selected activities.

2. Teachers classified on the basis of professional characteristics differ significantly in distribution of time

on each of the selected activities.

3. Teachers classified on the basis of type of school differ significantly in distribution of time on each of the selected activities used in this study.

4. Teacher activity patterns differ for various time units of the day.

Instrumentation and Methodology

Two types of data were needed. One type consisted of information about the criterion variable. The data for this variable was in terms of the percentage of time spent by teachers on selected activities performed throughout the school day. The percentage of time was determined on the basis of the number of observations made on a teacher performing a certain task.

Two trained observers situated in the schools observed the teachers in each of a conventional and team teaching school and recorded teacher activity on a data collection sheet. The activity of the teacher was recorded in terms of eighteen activity categories listed on the data collection sheet. Observations were randomly made and recorded throughout the normal school day.

The second type of data consisted of information about the predictor variables (type of school; age, sex, marital status, of teacher; field of specialization, years of education, years of teaching experience, of teacher). These data were collected by means of a brief questionnaire

which was completed by each teacher.

The time unit, another predictor variable, was derived by arbitrarily dividing the day into five units or periods of time.

Sample

The sample consisted of fifteen teachers, nine in the conventional school and six in the team teaching school. Both of the schools are located in Edmonton, Alberta. All fifteen teachers taught in Division II.

Each teacher was observed approximately three hundred times; each observation was recorded on the data sheet in terms of the category which represented the activity being performed by the teacher.

Results

A descriptive analysis of the data and the application of statistical tests to data formulated into positive hypotheses produced the following results.

Hypothesis 1.1: Teachers classified on the basis of age differ significantly in distribution of time on various activities during the school day.

A chi square test exhibited a significant difference between the distributions of activity scores when teachers were classified by age. Teachers were divided into three age groups. The Kruskal-Wallis test disclosed significant differences between activity scores in activities 1, 2, and 3. A difference at the .01 level of significance, the greatest

difference under this classification, was found in activity number 1, Conducting routine, and 2, Control. In activity 3, Presenting information, a significant difference at the .05 level of significance was found. The hypothesis was accepted in part.

Hypothesis 1.2: Teachers classified on the basis of sex differ significantly in distribution of time on various activities during the school day.

A significant difference between the distribution of scores was revealed by an application of a chi square test when teachers were classified by sex. A Mann-Whitney U test indicated that scores differed significantly, at the .04 level of significance, in only one activity--number 10, Clerical writing. The hypothesis was partly accepted.

Hypothesis 1.3: Teachers classified on the basis of marital status differ significantly in distribution of time on various activities during the school day.

While the distributions of activity scores, according to a chi square test, were shown to be significantly different at the alpha level of .001, the Mann-Whitney U test revealed no significant differences between scores in any of the individual activities. Therefore, the hypothesis was not supported.

Hypothesis 2.1: Teachers classified on the basis of field of specialization differ significantly in distribution on various activities during the school day.

At the .001 level of significance, the chi square

indicated an important difference between distributions of scores. Upon this basis the next test, a Kruskal-Wallis, was applied which manifested no differences between the scores in any of the activities. This evidence prompts a rejection of the hypothesis.

Hypothesis 2.2: Teachers classified on the basis of years of education differ significantly in distribution of time on various activities during the school day.

Distributions of scores were different because a probability of .001 was associated with the chi square calculated from these scores. But, a Kruskal-Wallis test disclosed no H's which were associated with a probability of .05. Thus, the hypothesis was rejected.

Hypothesis 2.3: Teachers classified on the basis of years of teaching experience differ significantly in distribution of time on various activities during the school day.

Because a chi square, which was large enough to be associated with a probability of .001, manifested itself, the distributions of scores were deemed essentially different. Further testing by the Kruskal-Wallis exposed a significant difference at the .02 alpha level between scores in activity 9 (Creative writing). The hypothesis was partly accepted.

Hypothesis 3 : Teachers classified on the basis of type of school differ significantly in distribution of time on various activities during the school day.

A chi square test indicated a significant difference

between the distribution of teacher activity scores when teachers were grouped according to the type of school. The Mann-Whitney U revealed that teachers, when classified by type of school, differ on the activity score in activities 1, 6, 7, 14, and 18. The greatest differences under this classification between teacher scores was in activity number 1 (Conducting routine) and in activity 6 (Observing) there were great differences between teacher scores in activity number 14, Transition (teacher) and activity number 18, Unable to observe. The least difference between scores of the five activities was in activity number 7, Interacting with adults. The hypothesis was partly accepted because differences were found in some activities.

Hypothesis 4 : Teacher activity patterns differ for various time units of the day.

A chi square test indicated that distributions of scores differed at the .001 level of significance. The Kruskal-Wallis test suggested that scores differed significantly at the .05 level in activities 1 (Conducting routine), 4 (Instructional supervision), 7 (Interacting with adults), 15 (Travel), 16 (Personal), and 17 (No interpretable activity). Consequently, the hypothesis was partly accepted.

In order to determine the association between variables (type of school, age, time unit of day) related to significant differences between activity scores in the same activity, a chi square test was applied.

The chi square test indicated that, in activity 1 (Conducting routine), there were significant differences between the distribution of scores in each group when teachers were classified on the basis of type of school and age. Thus, type of school and age are dependent variables.

The chi square test revealed that in activity 1 (Conducting routine) the distribution of scores differed significantly when teachers' scores were classified on the basis of teacher age and time unit of the day.

CONCLUSIONS AND IMPLICATIONS

In this section some conclusions are drawn about the results of this study and some implications are made. These conclusions and implications are made on the basis of the findings from a very small sample. Because of this the findings are very limited as to generalizability.

Conclusions

The organization of the school (type of school) seems, on basis of the findings which revealed significant differences between scores in five activities, to have a relationship or association with the amount of importance, emphasis, or value a teacher associated with these activities. While there was an association between these variables (type of school and time used) in certain activities, an association between other variables and time used existed in two of the same activities.

Second, the age of the teacher seemed to be associated with his distribution of time in three activities. Again, there were associations between other predictor variables and the criterion variable (time used) in one activity.

Third, the sex of the teacher seemed to be associated with the criterion variable in one activity; no other predictor variables were found to be associated with the criterion variable in this activity.

Fourth, the predictor variables marital status, field of specialization, and years of education did not seem to be associated with the criterion in any of the activities.

Fifth, time of day seemed to be associated with the criterion variable in six activities. Other predictor variables were associated with the time used in two of these activities.

Sixth, age seemed to be associated to two other predictor variables which were not dependent on each other.

Implications

On the assumption that the findings have reliability, some of the significant associations suggest specific implications for administrative practice and teaching. Because teachers in a team-teaching school spend a greater percentage of time on activities such as observing, transition, and interacting with adults, administrators in team-teaching schools should establish a climate which will provide teachers with the opportunity to observe other teachers in the teaching

process and to interact during the school day with adults. They should realize that team teachers, probably because of the physical structure, move from teaching station to teaching station. Thus, the administrator in the team-teaching school should encourage an informal climate whereby teachers feel unrestricted and relaxed. While this may be the climate required in a team teaching school, administrators must be alert to the possibility that team teaching might encourage informality to the point that inefficiency reigns.

The present study involving a very small sample of teachers revealed some associations which warrant further research.

1. Further research in this area would support or reject the findings of the present study, thereby showing the validity or invalidity of the present study, or revealing other influential variables.

2. More study aimed at determining the association and influence of the type of school organization and structure is necessary to evaluate more thoroughly team-teaching schools.

BIBLIOGRAPHY

BIBLIOGRAPHY

A. BOOKS

- Beggs III, David W. (ed.). Team Teaching Bold New Venture. London: Indiana University Press, 1966.
- Castetter, William B. Administering the School Personnel Program. New York: The Macmillan Company, 1962.
- Chapanis, Alphonse. Research Techniques in Human Engineering. Baltimore: John Hopkins Press, 1959.
- Costello, Timothy W. and Sheldon S. Zalkind. Psychology in Administration. Englewood Cliffs, N.J.: Prentice-Hall Inc., 1963.
- Ferguson, George A. Statistical Analysis in Psychology and Education. Toronto: McGraw-Hill Book Company, 1966.
- Gage, N.L. Handbook of Research on Teaching. Chicago: Rand McNally & Company, 1963.
- Harris, Chester W. (ed.). Encyclopedia of Educational Research. New York: The Macmillan Company, 1960.
- Hays, William L. Statistics for Psychologists. Toronto: Holt, Rinehart and Winston, 1963.
- Heiland, R.E. and W.J. Richardson. Work Sampling. New York: McGraw-Hill, 1957.
- Hillson, Maurie. Change and Innovation in Elementary School Organization. Chicago: Holt, Rinehart and Winston, 1966.
- Parsons, Talcott. The Structure of Social Action. Glencoe, Illinois: The Free Press, 1949.
- Ryans, David G. Characteristics of Teachers. Menasha, Wisconsin: George Banta Company, Inc., 1960.
- Seigel, Sidney. Nonparametric Statistics for the Behavioral Sciences. Toronto: McGraw-Hill Book Company, Inc., 1956.
- Shaplin, Judson T. and Henry F. Olds, Jr. Team Teaching. New York: Harper and Row, Publishers, 1964.

Tolman, Edward C. "A Cognitive Motivation Model," Theories of Motivation in Learning, Richard C. Teevan and Robert C. Birney, editors. Toronto: D. Van Nostrand Company, Inc., 1964.

Wilhelms, Fred T. "The Curriculum and Individual Differences," Individualizing Instruction, 61st Yearbook of the National Society for the Study of Education, Part I, 1962.

B. PERIODICALS

Anderson, Robert H. "Organizational Character of Education: Staff Utilization and Deployment," Review of Educational Research, 34: 455-469, October, 1964.

Angrave, Hames. "Team Teaching and Nongraded: A Case for Individual Timetabling in Canadian Schools," Canadian Education and Research Digest, 5: 48-59, March, 1965.

Bahner, John M. "Team Teaching in the Elementary School," Education, 85: 337-341, February, 1965.

"Bay City Experiment," Journal of Teacher Education, 78: 100-142, June, 1965.

Davis, Harold S. "Planning for Team Teaching," Education, 85: 333-336, February, 1965.

Dukes, William F. "Psychological Studies of Values," Psychological Bulletin, 52, 1955.

Ediger, M. "Team Teaching and the Schools; Advantages and Disadvantages," High Points, 47: 55-57, December, 1965.

Hagstrom, Ellis D. "The Teacher's Day," The Elementary School Journal, 62: 422-431, May, 1962.

Joyce, Bruce R. "Staff Utilization," Review of Educational Research, 37: 323-336, June, 1967.

Lambert, Philip, William L. Goodwin, and William Wiersma. "A Study of the Elementary School Teaching Team," Elementary School Journal, 66: 28-34, October, 1965.

National Education Association. "Team Teaching," Research Bulletin, 45: 114-115, December, 1967.

_____. "Teacher Load in 1950," Research Bulletin, 29: 4-49, February, 1951.

- Nystrand, Raphael O. and Frederick Bertolaet. "Strategies for Allocating Human and Material Resources," Review of Educational Research, 37: 448-468, October, 1967.
- Stafford, Curt. "Teacher Time Utilization with Teacher Aides," The Journal of Educational Research, 56: 82-88, 1962.
- Trump, Lloyd J. "What is Team Teaching." Education, 85: 327-332, February, 1965.

C. UNPUBLISHED MATERIALS

- Bishoff, Francis Xavier. "An Evaluation of a Team Teaching Project." Unpublished Master's thesis, University of Alberta, Edmonton, 1967.
- Christensen, Paul E. "Utilization of Professional Manpower in the Teaching Profession." Unpublished Doctoral dissertation, Wayne University, 1955.
- Fenske, Milton Reinhold. "An Analysis of the Work-Week of a Sample of Central High School Teachers." Unpublished Master's thesis, University of Alberta, Edmonton, 1961.
- Holowach, Nicholas. "Staff Utilization in Alberta Secondary Schools." Unpublished Master's thesis, University of Alberta, Edmonton, 1967.
- Ward, Kenneth Lyle. "Team Teaching in Western Canada." Unpublished Master's thesis, University of Alberta, Edmonton, 1967.

APPENDIX A

QUESTIONNAIRE AND DATA SHEET

TEACHER'S QUESTIONNAIRE

Name _____ Age _____ Sex _____

Marital Status _____

Years of University and Professional Education _____

Where Education Obtained _____

Major Field of Specialization _____

Years of Teaching Experience (including present) _____

Years of Experience at Present School (including present) _____

Previous Teaching Experience:

grades taught in elementary school _____

subjects taught in high school _____

other _____

Years of Administrative Experience (including present) _____

Teaching Assignment:

Conventional School Staff Only:

grade _____ room _____

Subjects taught to these pupils by other teachers _____

teaching assignments in other classrooms _____

Team Teaching School Staff Only:

subjects taught in Division II _____

teaching assignments in other classrooms _____

DATA SHEET

Date: Month _____ Day _____ School _____

Time: Start _____ Stop _____ Observer _____






Activities

- | | |
|-----|-------------------------------|
| 1. | Conducting Routine |
| 2. | Control |
| 3. | Presenting information |
| 4. | Instructional supervision |
| 5. | Non-instructional supervision |
| 6. | Observing |
| 7. | Interacting with adults |
| 8. | Reading |
| 9. | Creative writing |
| 10. | Clerical writing |
| 11. | Clerical, general |
| 12. | Materials manipulation |
| 13. | Transition (pupils) |
| 14. | Transition (teacher) |
| 15. | Travel |
| 16. | Personal |
| 17. | No interpretable activity |
| 18. | Unable to observe |

REQUEST FOR ASSISTANCE IN GRADUATE STUDENT RESEARCH PROJECT

Organization or person from whom assistance is requested:

Edmonton Public School Board

Name of graduate student investigator Murray Ellison and Larry Gilbert

Purpose of the research project To compare teacher activity in Division II of
conventional and team teaching schools. One part of the study will sample
teacher activity at various times during the school day; the other part will
compare verbal communication in the two schools.

Specific assistance requested (use supplementary pages if necessary) _____

Requests - Two schools: one conventional; the other designed specifically for team
teaching. They should be matched as closely as is feasible for school's age, for
characteristics of communities served, and for enrolment in Division II.

Procedure - Observations will be made over a period of approximately three weeks,
commencing the last week in April. Following the selection of the schools, the
investigators would meet with the Principal and Division II teachers of each school
to outline specific procedures.

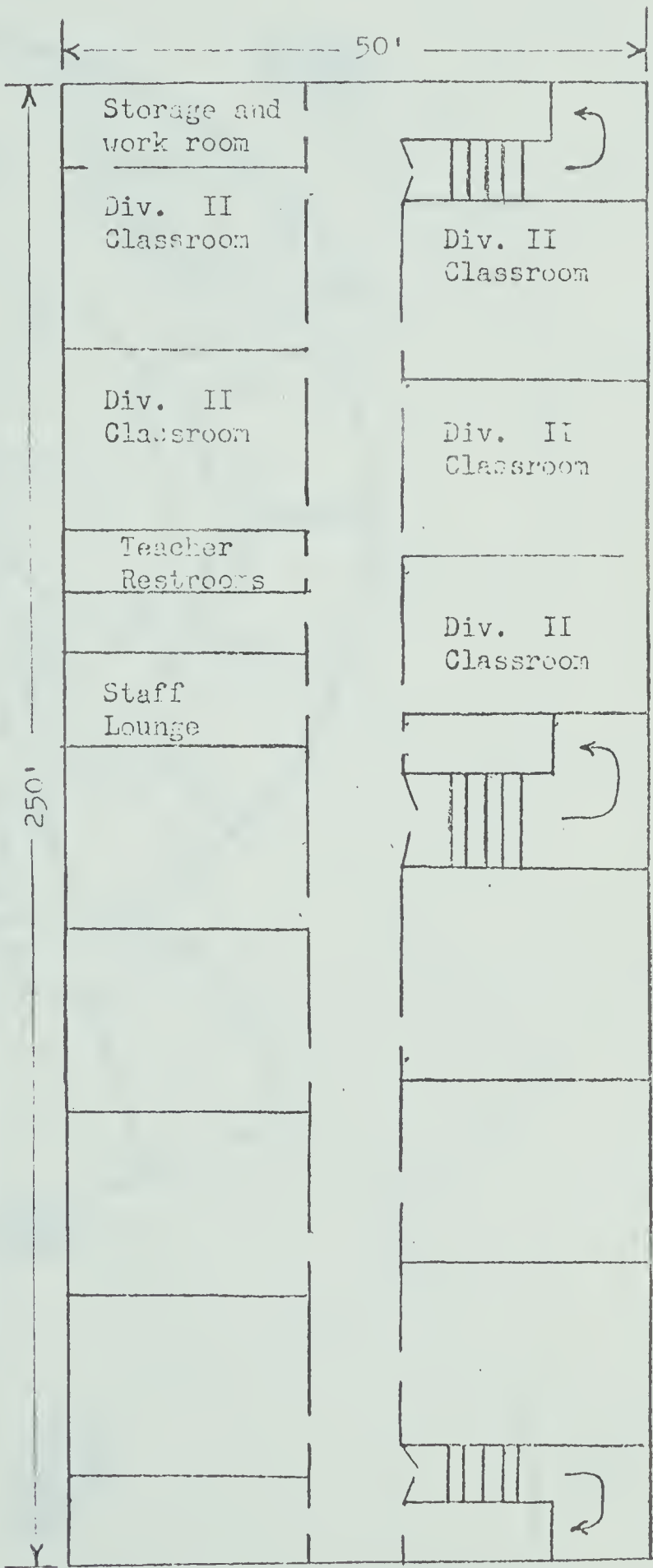
Feedback - The investigators believe that the findings of their study will provide
educators with a helpful and reliable comparison of teacher activity under the two
types of instructional organization. The findings will be made available to all
participants. Data will be collected and reported for groups of teachers.
Anonymity is assured.

APPENDIX B

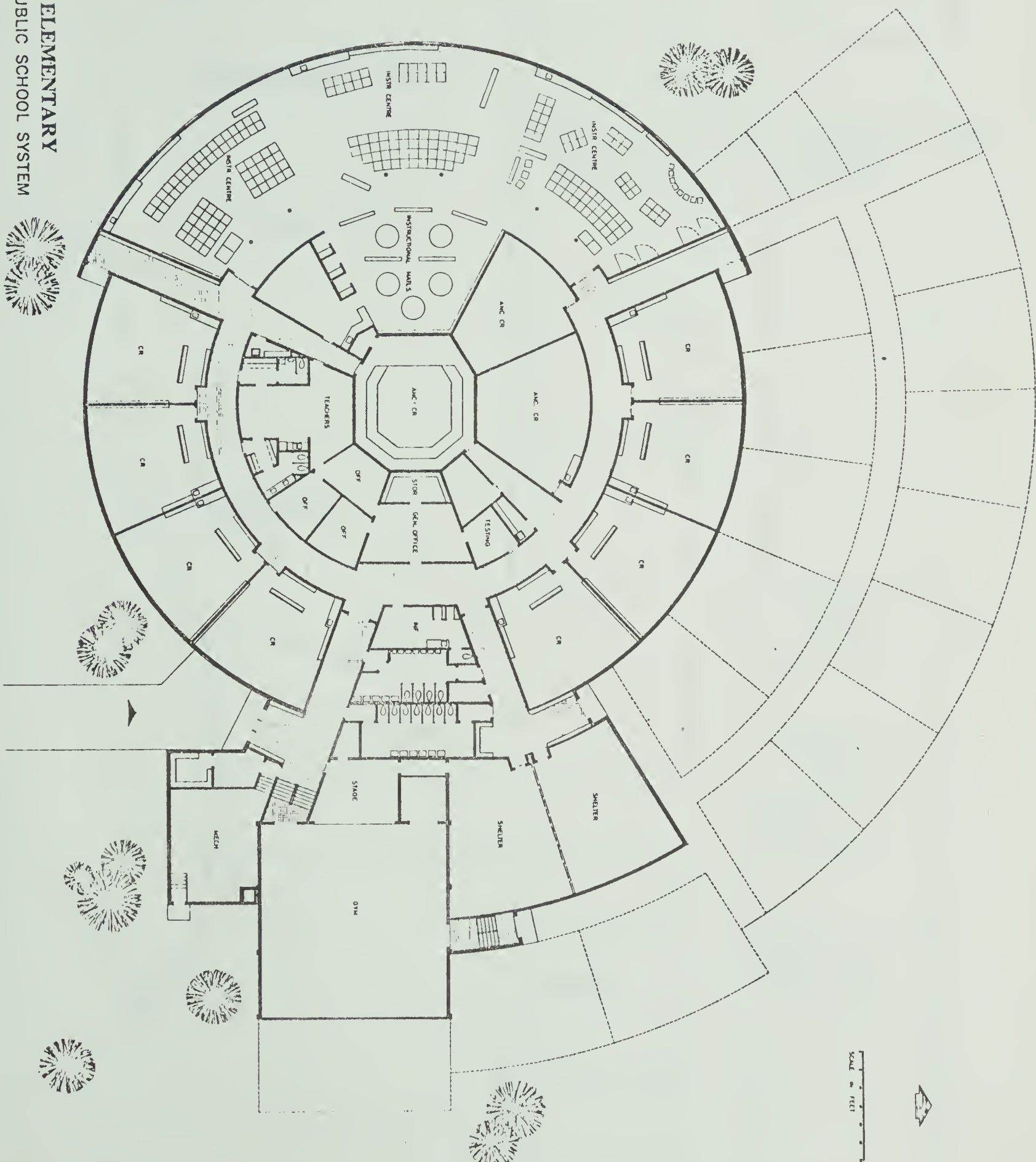
FLOOR PLANS OF SCHOOLS

CONVENTIONAL SCHOOL

Second Floor



ELEMENTARY
EDMONTON PUBLIC SCHOOL SYSTEM

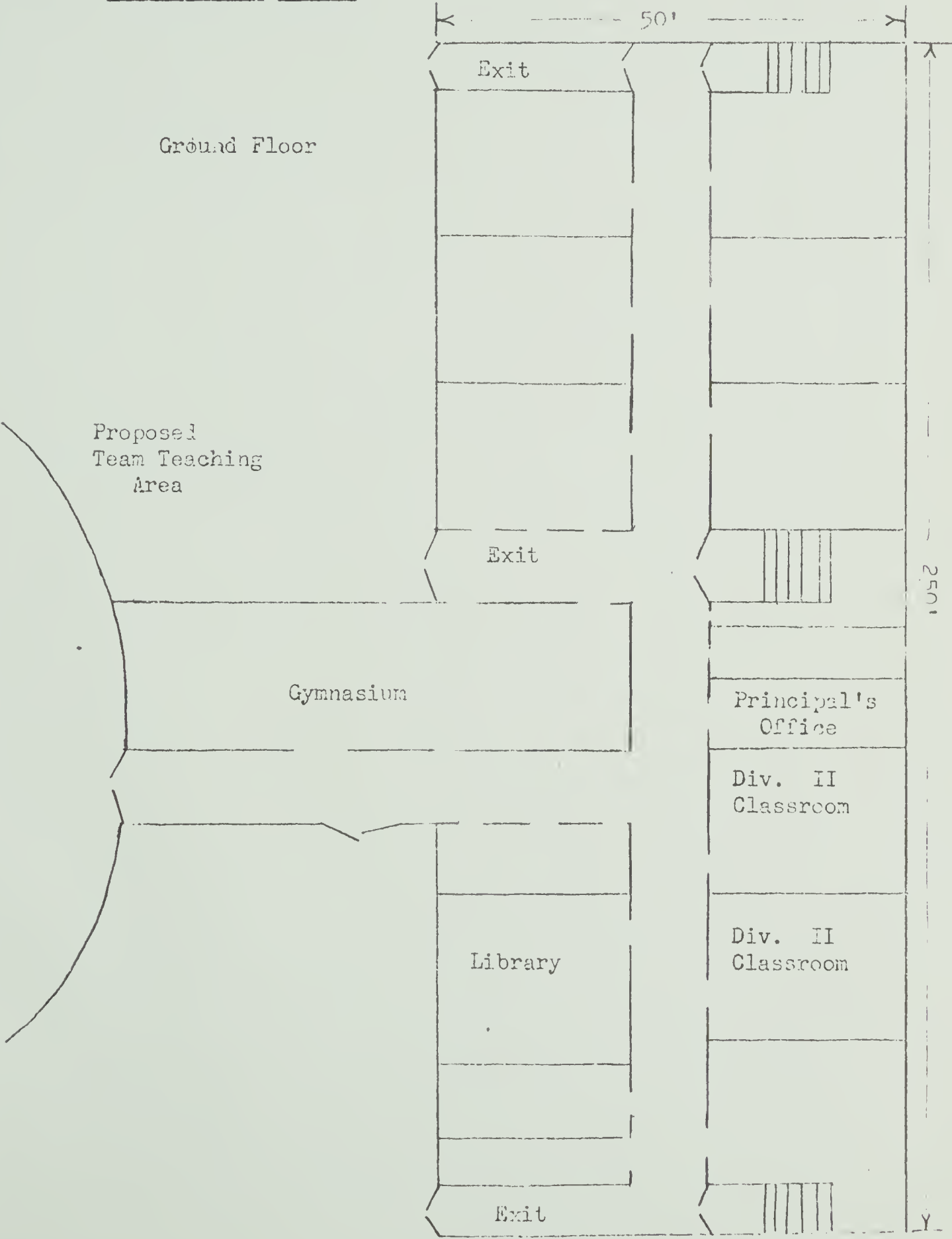


SCALE IN FEET



CONVENTIONAL SCHOOL

Ground Floor



B29893